Vol. 37 Toronto, December 19, 1923 No. 51

Contract Record and Engineering Review

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1924 CONFIDENCE 1924

MARSHALL FOCH AT A CRITICAL PERIOD DURING THE BATTLE OF THE MARNE, WHEN HIS RIGHT WING HAD BEEN DRIVEN BACK AND AN IMPORTANT POSITION LOST, REPORTED—"SITUATION EXCELLENT, OFFENSIVE WILL BE VIGOROUSLY PROSECUTED." THINGS MIGHT HAVE BEEN BETTER BUT HE HAD CONFIDENCE, AND WITH CONFIDENCE THE COURAGE TO ACT, AND SUCCESS WAS HIS REWARD.

WE WISH, FOR YOU, SUCCESS IN NINETEEN TWENTY-FOUR. CONFIDENCE WILL HELP. CONFIDENCE TO GO AHEAD AND BUY IF YOU WANT A THING---CONFIDENCE TO ASK A FAIR PRICE IF YOU HAVE SOMETHING TO SELL. WITH CONFIDENCE AND COURAGE THE COMING YEAR CAN BE MADE A SUCCESSFUL YEAR FOR ALL OF US.

YOU HAVE OUR BEST WISHES.

The
Toronto Brick Company, Ltd.
Sun Life Building, Toronto

Alphabetical Index to Advertisers Page 16 Classified Directory to Advertisements Page 6

Why does a building, constructed of, or trimmed with, natural stone, always look more substantial, permanent and dignified than when substitutes are used?

The answer lies in the inherent strength, honesty and durability of the stone itself.

The dignity of the Hamilton Technical School facade with its strict classic design, is mainly obtained by the use of Indiana limestone columns and trimmings.

All cut-stone for this building supplied by

The Ritchie Cut Stone Co. Ltd.

Hamilton, Ont.

LET US QUOTE ON YOUR REQUIREMENTS

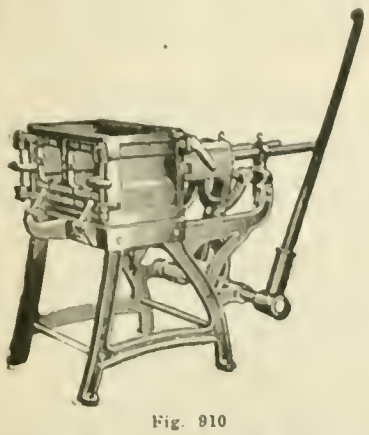


Fig. 910
IDEAL CONCRETE BLOCK MACHINES
THE WORLD'S STANDARD

The Ideal Concrete Block Machines stand supreme the world over, and the Ideal Concrete Blocks are accepted as the standard for Concrete Block Construction by Engineers everywhere.

The Ideal Block Machine makes every style of block required.

—Fully described in Catalogue No. 22-B-1

Make Concrete Blocks, Concrete Brick, Lintels, and Sills during the winter months and keep your labor employed.

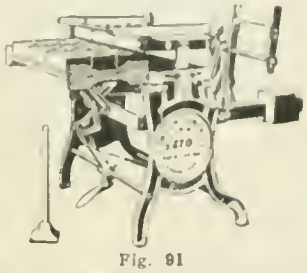


Fig. 91
LONDON CEMENT BRICK MACHINE
Hand Power

Capacity, 5,000 bricks per day. Makes brick with smooth faces on all sides and with frog impression. This is the best hand-operated cement brick machine on the market. Brick can be made on the ground where building is to be erected. There are big profits in the manufacture of Cement Brick.

—Described in Catalogue U.

Ideal Concrete Products Plants everywhere have been enjoying prosperity during the past year. **WHY?** Because the Ideal Concrete Blocks are now recognized as standard building materials and in large demand in every vicinity where buildings are being erected.

The machines illustrated herein are all that is required to start in the business. A complete plant can be installed for a few hundred dollars. The profits in the business will more than justify the expense.

Fig. 430
LONDON ADJUSTABLE SILL, STEP AND LINTEL MOULD

The London is the Only Absolutely Adjustable Mould on the market. It makes sills, steps and lintels any size, and with any bevel. Saves the price of itself in one building. —Described in Bulletin O-R-S

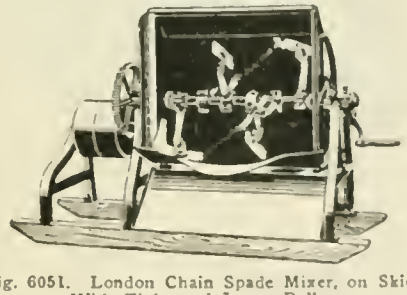


Fig. 6051. London Chain Spade Mixer, on Skids With Tight and Loose Pulley

This machine is particularly suitable for stationary plants, for mixing semi wet concrete for making concrete blocks, tile, or cement brick. This kind of concrete requires considerable tempering with a very small quantity of water. The London Chain Spade Mixer was designed particularly for this class of work.

—Described in Bulletin 49 M 1

What we have done for others we can do for you

Full particulars on request.

Made in Canada

We manufacture concrete Mixers, Hoists, Elevators, Air Compressors, Pumps, Brick, Block and Tile Machines, Barrows, Carts, Silo Moulds, Ornamental Moulds and Tools.

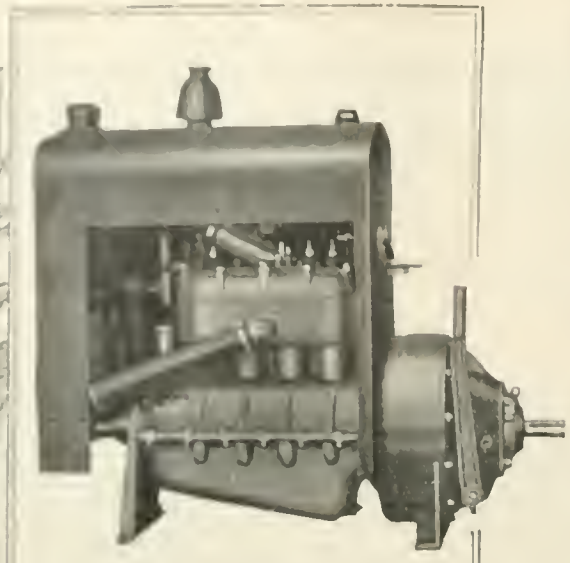
The London Concrete Machinery Co., Limited

Dept. 7 London, Canada

Worlds Largest Manufacturers of Concrete Machinery

Sales Offices and Warehouses :

R. R. Power, Halifar, N. S.
T. McAvity & Son, St. John, N.B.
Rene Talbot, Quebec, Que.
O. E. Barnard, Sherbrooke, Que.
Foss Machinery Limited, Montreal
Harvard Turnbull & Co., Toronto
General Supply Co. of Canada, Ottawa
J. E. Middleditch, Windsor, Ont.
E. A. Muir, Port Arthur, Ont.
Dominion Equipment & Supply Co., Winnipeg.
Gorman's Limited, Calgary and Edmonton
MacKenzie Supply Co., Regina, Sask.
Building Products & Fuel Ltd., Saskatoon, Sask.
C. T. Nelson, Victoria, B.C.
B. C. Equipment Co., Vancouver
Whitelock & Marlatt, Moose Jaw, Sask
West Kootenay Equipment & Construction Co., Nelson, B. C.



The Le Roi Four Cylinder Engine

RELIABILITY

backed by years of reputation

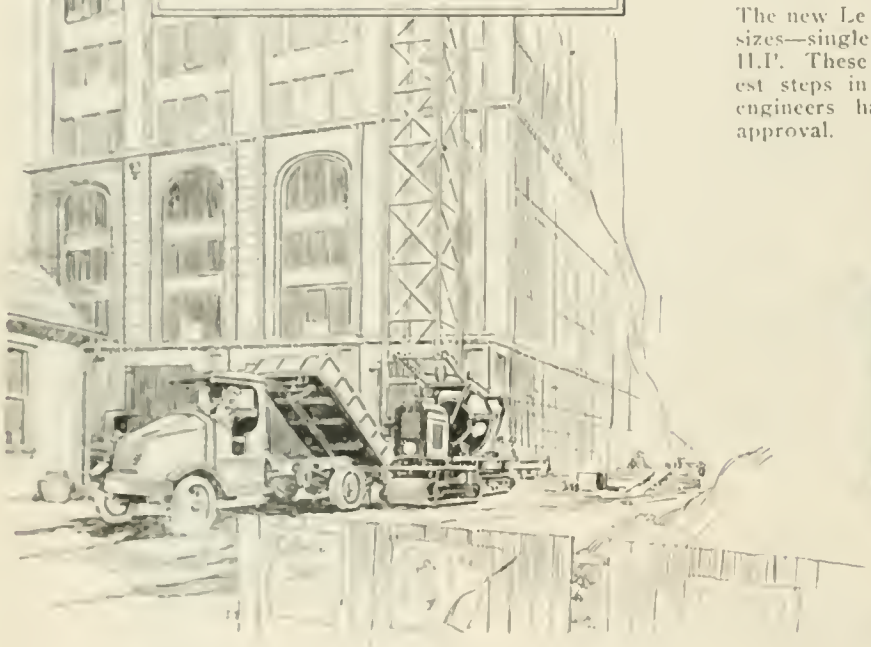
You can have confidence in Le Roi Engines. For they are backed by years of engine building experience.

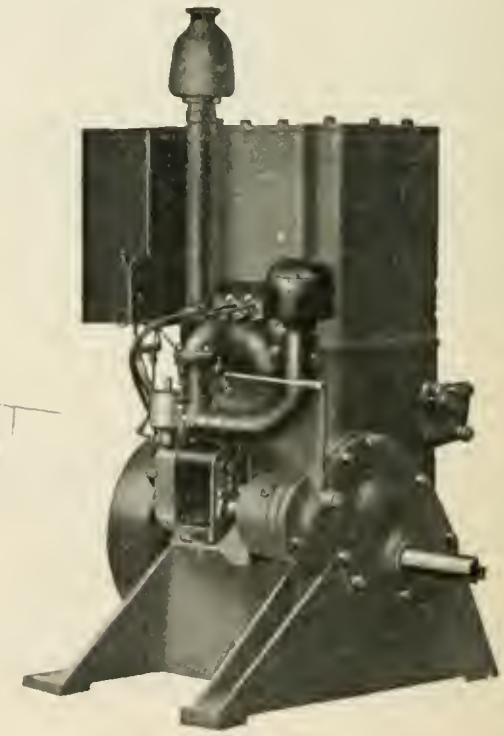
What this experience means to you as a contractor, engineer or builder is that your power unit on the job—whether for the concrete mixers, pumps, hoists, or air compressor—is designed and built right, to give years of uninterrupted service.

And that "service" means plenty of steady, unfailing power at the lowest possible operating cost. Extra strength to give extra power is built into every part—insuring long life, and reliability with vibration reduced to a minimum. All wearing parts are interchangeable.

Le Roi Radiator cooled type engines are made in two sizes—two and four cylinder—furnishing from 5 to 45 H. P.

The new Le Roi Hopper cooled type is made in two sizes—single and double cylinder—furnishing 3 to 8 H.P. These engines are considered one of the greatest steps in engine construction. Contractors and engineers have already given them their hearty approval.





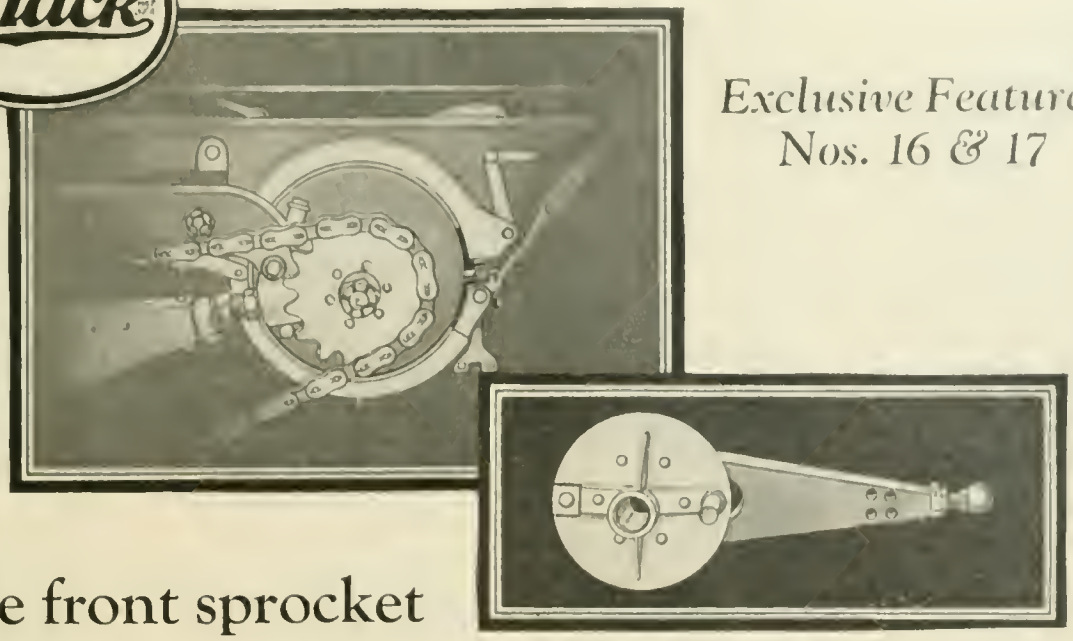
If you want to know more about the quality and reputation of these famous engines, let us send you an interesting folder illustrating and describing in detail the various types and sizes.

Le Roi Company
5906 Mitchell Street
Milwaukee Wisconsin

LE ROI ENGINES

"for dependable power"

Mack



Exclusive Features
Nos. 16 & 17

The front sprocket
The pressed steel radius rod

WHEN the International Motor Company developed a drop-forged front sprocket, case-hardened its teeth and used it in conjunction with hardened chain rollers, the present-day efficient Mack chain drive was made possible. This drive not only performs efficiently and economically under normal going but has no equal when operating under adverse load and road conditions.

The Mack pressed steel radius rod is made in channel section and is lighter for a given strength and more flexible than common cast rods. This construction assures unvarying chain centers under all driving conditions. The large ball joint at its front end permits a single connection that adjusts itself to chassis movements. It is held by a socket that forms part of a drop-forging bolted to the chassis frame independent of the jackshaft.

MACK TRUCKS OF CANADA, LTD.
28-30 Vanauley Street, Toronto, Ontario

List of Dealers

ONTARIO

Ottawa:
John Heney & Son, Ltd.,
40-42 Elgin St.

London:
W. J. Chisholm,
478 Richmond St.

Niagara Falls:
D. G. Bawtinheimer,
3 Imperial Bank Bldg.

Windsor:
H. E. Ponsford

Sarnia:
R. S. Bulman,
228 Christina St. North

QUEBEC

Montreal:
Ledoux Jennings, Limited,
600 St. Catherine St. W.

Quebec:
A. E. Faucher,
St. Ursule Hotel

MANITOBA

Winnipeg:
Consolidated Motors, Ltd.,
235 Main Street

PERFORMANCE COUNTS

CLASSIFIED INDEX TO ADVERTISEMENTS

The following regulations apply to all advertisers:—Eighth page, every issue, three headings; quarter page, six headings; half page, twelve headings; full page, twenty-four headings

Air Power Pans
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Sturtevant, B. F. & Co
Air Compressors
Canadian Ingersoll Rand Co
Air Washers
Canadian Blower & Forge Co
Sturtevant, B. F. & Co
Automobiles
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Buckets, Grab
Industrial Works
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Rogers Supply Co
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Canadian Equipment Co.
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Canadian Mead Morrison Co
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London Concrete Machry Co
Concrete Carts
Canadian Welding Works
F. H. Hopkins & Co., Ltd.
London Concrete Machry Co
Concrete Culvert Pipes
Dominion Concrete Company
Concrete Machinery
Canadian Austin Machinery
F. H. Hopkins & Co., Ltd.
Kochring Co., of Canada
London Concrete Machry Co
Mussens Limited
Wettlaufer Bros.
Concrete Mixers and Appliances
Canadian Austin Machinery
Hopkins & Co., Ltd., F. H.
Kochring Co., of Canada
Mussens Limited
Turnbull & Co., Harvard
Wettlaufer Bros.
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Spielman Agencies Regd
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Dominion Concrete Company
Concrete Tile
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National Conduit Company
Vitrified Clay Pipe Publicity Bureau
Conduits (Wooden Pressure Creosoted
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Ball Engine Co.
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Canadian Equipment Co.
Canadian Mead-Morrison Co.
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Britnell, Limited
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Canada Crushed Stone
Crushed Stone, Limited
Hagersville Crushed Stone Co.
Hagersville Quarries Ltd.
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Inglis Co., John
Jeffrey Manufacturing Co.
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Mussens Limited
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Oakley & Sons, Geo.
Ritchie Cut Stone Co.
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Dom. Tar & Chemical Co., Ltd.
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Canadian Mead-Morrison Co.
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Mussens Limited
Ditching Machines
Ball Engine Co.
Buckeye Traction Ditcher Co.
Canadian Austin Machinery
Erie Steam Shovel Co.
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Mussens Limited
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Canadian Austin Machinery
Canadian Equipment Co.
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Mussens Limited
Orton & Steinbrenner Co.
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Canadian Blower & Forge Co.
Dredges
Canadian Equipment Co.
Canadian Mead-Morrison Co.
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Mussens Limited
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Canadian Ingersoll-Rand Co.
Hopkins & Co., Ltd., F. H.
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Dust Blowers
Canadian Blower & Forge Co.
Sturtevant, B. F. & Co.
Dump Bodies
Dominion Truck Equipment Co
Wood Hydraulic Hoist & Body Co.
Dump Cars, Wheels, etc.
Canadian Equipment Co.
Dominion Bridge Co., Ltd.
Hopkins & Co., Ltd., F. H.
MacKinnon Steel Company
Mussens Limited
Drying Apparatus
Canadian Blower & Forge Co.
Sturtevant, B. F. & Co.

(Continued on page 8)

Storage Yard of Doolittle Russell Ltd., Hamilton, Ont.

These Bins Were Made By The Hamilton Bridge Works

Company Limited

If the remarkable story of Doolittle Russell Ltd., of Hamilton, Ont., were written in one word, it would be none other than "Service." And this "Service" which they are enabled to give their clients is made possible by the splendid equipment maintained.

In the photograph above is shown the four large-capacity steel bins, providing respectively for 2-in. crushed stone, 1-in. crushed stone, ½-in. stone screenings and concrete sand. Each bin is fitted with two spouts, closed with counterweighted gates. It was these bins which played such an important part in the erection of the Lister Building. Read the account on page 1206 of this issue.

Is the money spent for equipment of this kind an expense or an investment? Ask Doolittle Russell Ltd.!

Check over your own list of equipment. Is it sufficient to your needs or are you sacrificing efficiency to save the moderate outlay involved?

If you decide that additional hoppers, bins, etc. are needed let us quote the prices.

THE HAMILTON BRIDGE WORKS COMPANY

LIMITED

Head Office and Works - Hamilton, Canada

Branch Office - 410 General Assurance Building, Toronto, Canada

CLASSIFIED INDEX TO ADVERTISEMENTS—Continued

Flag Poles
MacKinnon Steel Company
McGregor & McIntyre

Floor Clips
Western Steel Products Limited

Floor Stands
Jenkins Bros. Ltd.

Flooring Materials
Carmichael Ltd., A. W.
Imperial Oil Company, Ltd.
National Fireproofing Co.
Sommer & Co., H. H.
Vitrified Clay Pipe Publicity Bureau

Forges
Canadian Blower & Forge Co.

Gantry and Cantilever Cranes
Orton & Steinbrenner Co.

Gasoline Engines
London Concrete Machry. Co.

Gravel
Allen Bros.
Brantford Sand & Gravel Co.
Rogers Supply Co.

Hammer Drills
Canadian Ingersoll-Rand Co.

Hardware
Hardware Co., of Toronto
Mercer Bros.

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Brompton Lumber & Mfg Co.
Eaton & Sons, J. R.

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Lumsden Engineering & Transport Co.

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Canadian Blower & Forge Co.
Crane, Limited
Sturtevant, B. F. & Co.

Hoists, Electric
Canadian Austin Machinery
Link-Belt Limited
Clyde Iron Works Sales Co.

Hoists (Truck)
Wood Hydraulic Hoist & Body Co., Ltd.

Hoisting Apparatus
Canadian Austin Machinery
Canadian Ingersoll Rand Co.
Canadian Mead-Morrison Co.
Clyde Iron Works Sales Co.
Hopkins & Co., Ltd., F. H.
Industrial Works
London Concrete Machry. Co.
Mussens Limited

Hoisting Engines
Canadian Mead Morrison Co.
Clyde Iron Works Sales Co.
General Products Co.
Hopkins & Co., Ltd., F. H.
Kochring Co., of Canada
London Concrete Machry. Co.
McGovern, T. J.
Mussens Limited
Turnbull & Co., Harvard

Hydrants
Canada Iron Foundries
Dominion Steel Products Ltd.
Kerr Engine Company
Gartshore Thompson Pipe Co.
McAvity & Sons, T.
Hepburn, Ltd., John T.

Hydrated Lime
Melville Quarry Co.
Muldoon, Ltd., J.
Standard Lime Co.

Ice Making Machinery
Canadian Ingersoll Rand Co.

Industrial Cars
Canadian Austin Machinery
Canadian Equipment Co.
Hopkins & Co., Ltd., F. H.
MacKinnon Steel Company
Mussens Limited

Inspecting Engineers
Canadian Inspection & Testing Laboratories
Hunt & Co., Robt. W.
Milton Hersey Company

Insulating Compounds
Dom. Tar & Chemical Co., Ltd
Imperial Oil Company, Ltd.
Spielman Agencies Regd.
Standard Underground Cable Co., of Canada Ltd.

Jib Cranes (all kinds)
Dominion Bridge Co., Ltd.
Hamilton Bridge Works Co.

Joist Hangers
Hamilton Bridge Works Co.

Kilns
Canadian Blower & Forge Co.
Dominion Bridge Co., Ltd.
MacKinnon Steel Company

Lead Pencils
American Lead Pencil Co.

Lime
Muldoon, Ltd., J.
Standard Lime Co.

Lockers (Clothes)
Canada Wire & Iron Goods Co

Locomotive Cranes
Ball Engine Co.
Canadian Austin Machinery
Canadian Equipment Co.
Link-Belt Limited
Erie Steam Shovel Co.
General Products Co.
Hopkins & Co., Ltd., F. H.
Kochring Co., of Canada
McGovern, T. J.
Mussens Limited
Orton & Steinbrenner Co.

Locomotive Steam
Canadian Equipment Co.

Locomotive Gasoline and Storage Battery
Canadian Austin Machinery
Fate-Root-Heath Co.
F. H. Hopkins & Co., Ltd.
Jeffrey Manufacturing Co.
Kochring Co., of Canada

Marble
Oakley & Sons, Geo.

Mechanical Rubber Goods
Jenkins Bros. Ltd.

Metal Lath
General Products Co.
Ormshy Company, A. B

Meters
Builders Iron Foundry

Motors
Lincoln Electric Co., of Canada Ltd.
Sturtevant, B. F. & Co.

Orange Peel Buckets
F. H. Hopkins & Co., Ltd.
Orton & Steinbrenner Co.

Ornamental Iron
Canada Wire & Irons Goods Co.
Dennis Wire & Iron Works Co.
Meldrum Iron Works Ltd.

Ornamental Moulds
London Concrete Machry. Co.

Paint (Heated Surfaces)
Barrett Company, Ltd.
Spielman Agencies Regd.

Paints and Varnishes
Hopkins & Co., Ltd., F. H.
Spielman Agencies Regd.

Paints (Bridge and Structural Iron and Pipe Coating)
Britnell, Limited
Dom. Tar & Chemical Co., Ltd
Imperial Oil Company, Ltd.
Spielman Agencies Regd

Panels (Hardwood & Veneered)
Laminated Materials

Paving and Paving Materials
Barrett Company, Ltd
Dom. Tar & Chemical Co., Ltd
Imperial Oil Company, Ltd.
Lumsden Engineering & Contracting Co.
Standard Lime Co.
Pacific Coast Pipe Co.
Vancouver Wood Pipe & Tank Company

Pencils((Lead)
American Lead Pencil Co.

Penstocks (Wood Stave)
Hamilton Bridge Works Co.
Pacific Coast Pipe Co.

Perforated Metals
Canada Iron & Wire Works
Greening Wire Co., B.

Pile Driving Machinery
Canadian Ingersoll-Rand Co.
Canadian Mead-Morrison Co.
Clyde Iron Works
Hopkins & Co., Ltd., F. H.
Mussens Limited

Pipe (Concrete, Iron & Wood)
Canada Iron Foundries
Canadian Pipe Co.
Dominion Concrete Company
Gartshore, Thompson Pipe Co.
National Iron Corporation
Pacific Coast Pipe Co.
Vancouver Wood Pipe & Tank Co.

Pipe (Steel)
Canadian Des Moines Steel Co.
Dominion Bridge Co., Ltd.
Horton Steel Works
Inglis Co., John
National Equipment Company

Pitch
Dom. Tar & Chemical Co., Ltd

Planing Mill Exhausters
Canadian Blower & Forge Co.

Plaster
Britnell & Company
De Giorgio, Limited

Plastering
Hynes Co., W. J.

Pneumatic Machinery
Canadian Ingersoll-Rand Co.
Laurie & Lamb

Portable Loaders
Jeffrey Manufacturing Co.

Posts (Indicator)
Jenkins Bros. Ltd.

Power Engines
Inglis Co., John

Prisms
Luxfer Prism Co.

Propeller Fans
Sturtevant, B. F. & Co.

Pumps and Pumping Machinery
Canadian Blower & Forge Co.
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Canadian Mead-Morrison Co.
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(Continued on page 10)

At the Trail's End of the Year

We are glad of the opportunity kindly custom affords us at this Christmas season to lay aside business for the moment and to extend to all our friends and customers good wishes and the season's greetings.

You and we are engaged in a worth-while task—a task which is a constructive contribution to the advancement of civilization and one in which both of us may well be proud to have such important parts: you as engineers and builders of concrete roads and permanent structures: and we, as manufacturers of staunch, dependable Heavy Duty pavers, mixers and cranes. And our position in the industry spurs us on to constantly increasing efforts to further improve and perfect this equipment so that we may be of even greater help to you, who are dedicating your lives to this great undertaking.

We therefore wish you a Merry Christmas, with twelve months of prosperity, fifty-two weeks of good health and three hundred and sixty-six days of happiness in 1924.

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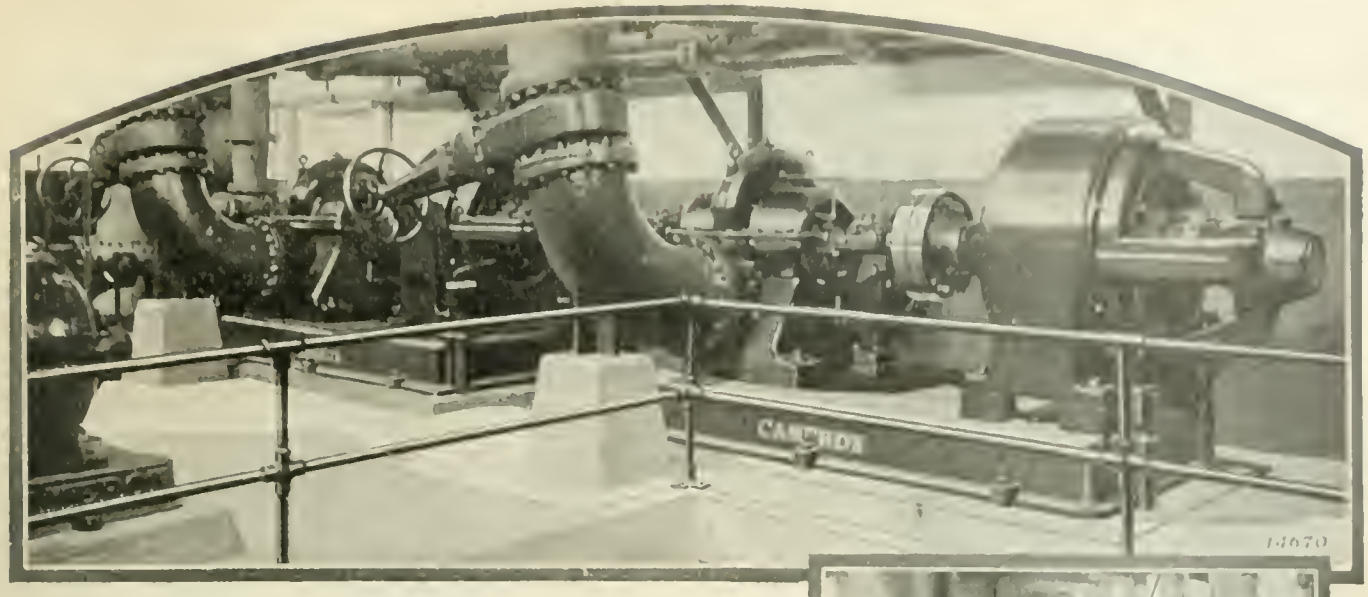

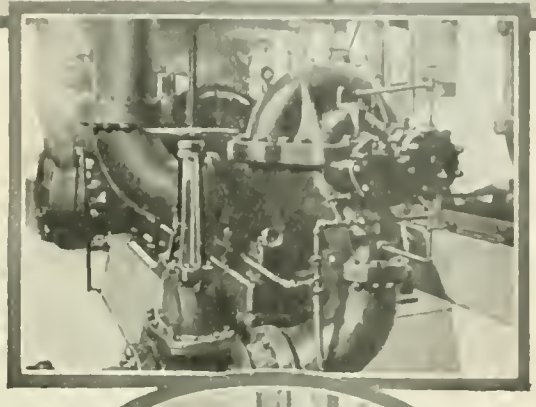

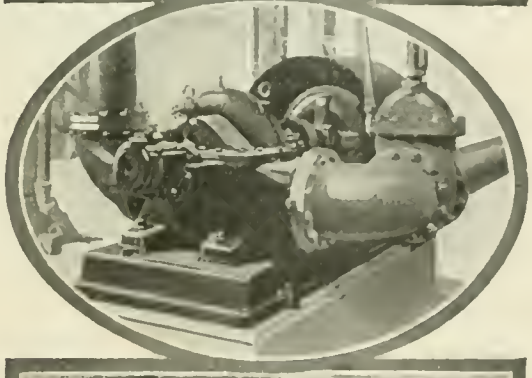

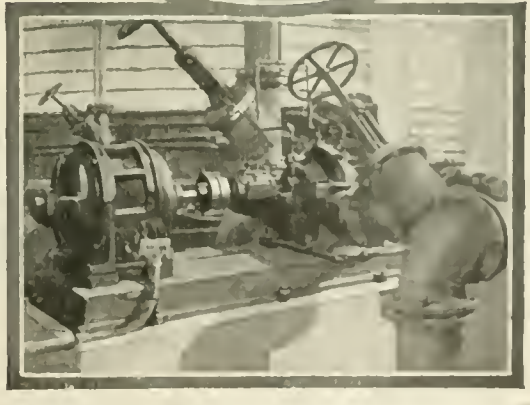

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BARBER-GREENE

No. 1 shows a Barber-Greene which provides a flexible loading system for the Pigeon-Murgagroff Company of Milwaukee. The Barber-Greene requires only one man and can load a truck with 5 cubic yards in 3 minutes. Further details below.

No. 2 and 3 show a Barber-Greene being used for stripping by the Continental Products Company of Caledonia, New York. No. 4 shows Barber-Greene U-Type Conveyor used for loading gravel by the District of Burnaby, Canada.

Providing a flexible loading system for washed sand and gravel

A washed sand and gravel plant in Wisconsin had a difficult loading problem to solve. Its sand and gravel are pumped from the adjacent pit and are finally discharged into storage piles. Each size, of course, is stored in a different pile.

Very often the sand in these piles, except that at the edges, is too wet to be sold. In order to load all the salable sand as soon and as fast as possible, an extraordinary flexible method of loading had to be found.

After investigating, it was decided to use a Barber-Greene.

It proved that it could load a maximum of 250 cubic yards of washed sand and gravel per day.

It proved that it could load a truck with 5 cubic yards in 3 minutes.

It is operated by one man. No help is needed; the automatic disc feed cleans up as it feeds.

In every way Barber-Greenes provide the flexible fast, economical system of loading that the conditions require. They move around under their own power to a pile where there is sand or gravel of the right size that is dry enough to be sold. They load as many trucks there as there is material available and then move on to another part of the pile, or to another pile, and load there.

There are, of course, many other methods of using Barber-Greenes in sand and gravel plants.

For additional information send for our sand and rock handling literature.

Also note photograph No. 4 showing the Barber-Greene U-Type Conveyor.

The base price on this conveyor has recently been reduced to $350.

Send for prices covering electric or gas engine equipment.

Ask our nearest office for particulars

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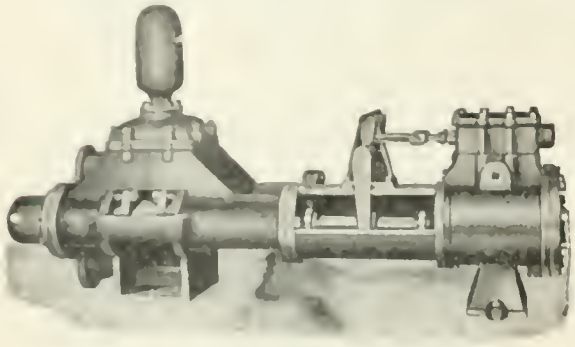

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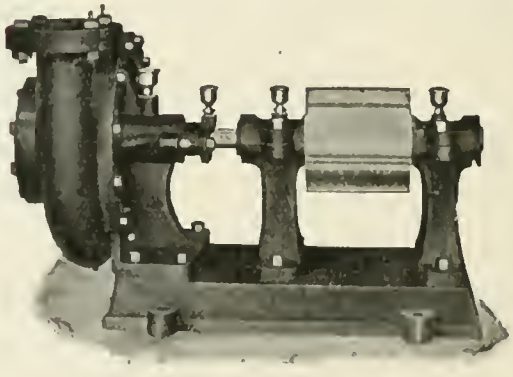

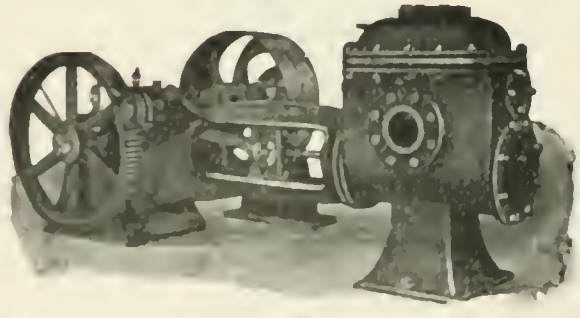

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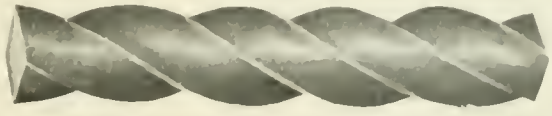

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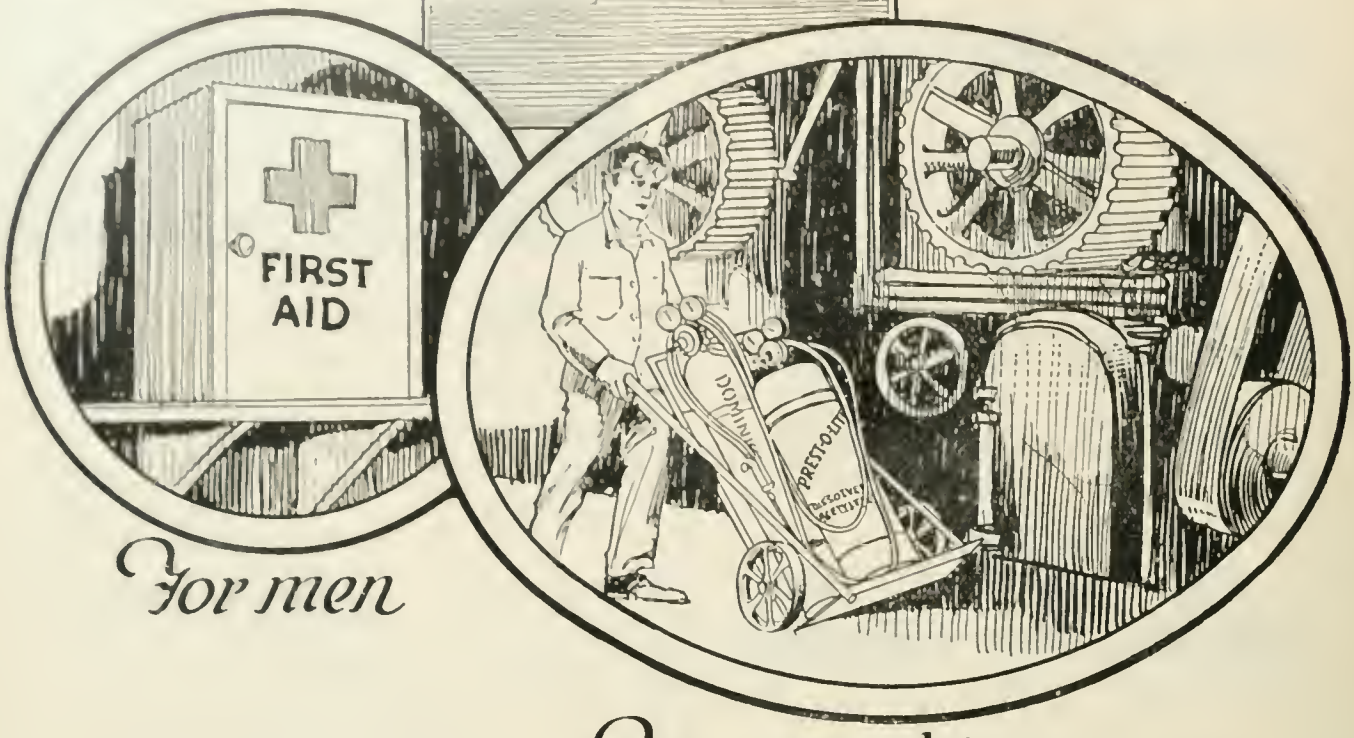

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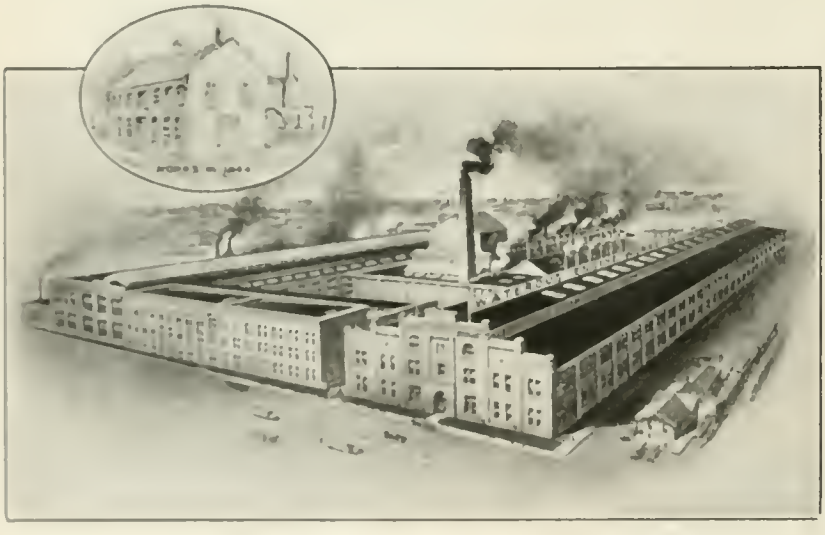

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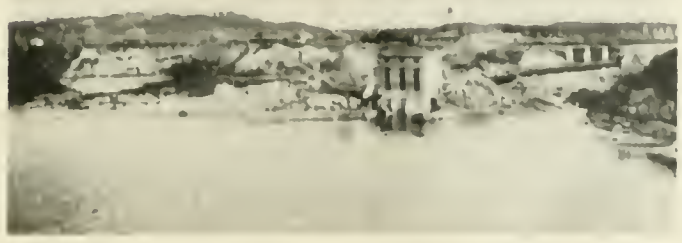
Contract Record and Engineering Review

Devoted to Construction and Engineering

Vol. 37 Toronto, December 19, 1923 No 51



A general view of the Indian Chutes development

New Power Plants in the North Country

Indian Chutes Plant of the Great Northern Power Co. and the Sturgeon Falls Plant of Northern Canada Power Ltd. Are the Latest Developments

The Indian Chutes plant of the Great Northern Power Company is located on the Montreal River, 12 miles above Elk Lake. The original falls had a head of 20 feet, but with controlled water elevation a head of 48 feet is now attained. The average low water flow is 450 to 500 c.f.s., the greatest flood discharge recorded 11,500. Ample provision has been made for flood conditions in the construction, the sluicing having a discharge capacity of 30,000 c.f.s., a safety factor of over 100 per cent.

The isolated situation of the power site necessitated the building of sidings and docks, where the T. & N. O. passes closest to Elk Lake. For the transportation of equipment 3 scows of 40 tons capacity each, were used. These were hauled up the 12 miles to the site by gasoline boats. At Indian Chutes there were also constructed a dock and tramway, the tramway car having capacity to handle the heaviest machinery. The construction included an inclined trestle, a hoist being used to haul the car up from the scow. The cement shed and concrete plant are located at the head of the hill at end of tramway.

Camp construction included the building of cookery and bunk camps for 150 men, water system and fire protection with a 3,000 gallon wood stave tank on a 40 foot tower. The pumping plant consists of 2 steam driven duplex pumps, one 200 g.p.m. and one 100 g.p.m. These had a big job during the fire of 1922. With 1000 feet of hose and 100 men working they saved the camp.

Construction Plant

The concrete plant for the job consisted of a one cu. yd. Smith cement mixer, and one 120 ft. tower. All the concrete in the dam and headworks was put in by chutes, after being hoisted up tower. The sand and rock bins discharged directly into mixer. At the power house there was a separate concrete plant for the ½ yd. mixer, where a 50 foot tower was used. All earth excavation was taken out by a derrick and clam shell bucket of one cubic yard capacity. All the sand required for concrete was excavated by derrick and clam, swung on main tramway, and dumped into bin at mixer. Drilling on rock was all done with an Ingersoll-Rand 43 fitted for steam. The concrete in the headworks was all poured in December and January. The backs of the forms were housed with tarpaulins and heated with live steam. All the rock excavation in the pipe line cut was hauled to the head works on cars and dumped into the rock fill dam by the derrick on top of headworks. All the rock necessary to complete dam and headworks was dumped in this way. Hoist from headwork picked up skips and dropped them direct into dam.

The construction of a new river channel was one of the most striking pieces of work on the job. In order to wash out the new river channel a small ditch was dug through, below and in front of dam, and

Power house of Sturgeon Falls plant, under construction, looking downstream

when river rose by blocking old channel with rock fill, sluiceways were opened and water used to wash new channel down to bedrock. Approximately 100,000 cubic yards were washed out in five hours.

Power house construction is of reinforced con

steel sash, concrete floor. A 12 ton hand operated travelling crane is used. It rests on a rock foundation.

The flume is a wood stave pipe, of B. C. fir, nine feet inside diameter, 312 feet long. It is laid in a cut through the rock and is made big enough for the ultimate capacity of three lines, 3500 yards of rock being excavated.

The entire design and construction was carried out by Stanley and Necklands, of New Liskeard, Mr. F. S. Armstrong being resident engineer.

Northern Ontario's hydro-electric resources are [illegible] augmented by the Sturgeon Falls plant of Northern Canada Power Limited, which has just been completed. This development is tied in with the Sandy Falls and Wawaitin Stations of the same company at the Timmins sub-station, thus providing a three-fold source of energy for customers.

The plant is located at Sturgeon Falls on the Mattagami River, a distance of about 30 miles northwest from Timmins. Advantage was taken in the design of the presence of an island, and the actual work was found to fit in very nicely with anticipations. The dam is of concrete, combination Ogee and pier type, about 500 feet long. Construction was carried out along the usual lines, first the unwatering of the main channel through the provision of temporary waterways, and then the power house excavation, followed by the concrete work. A one yard mixer was used and crushing was done by a No. 6 Austen machine. All work was elevated to a bin above the mixer. Concrete was put in by chutes from an elevated track. Practically the entire power house was built in the winter time, steam being used for heating.

As the plant is comparatively isolated, the transportation of heavy machinery to the site was a considerable job. It was accomplished by using scows from Timmins. These carried the parts to the site of the Sandy Falls plant. Here a mile portage was necessary and the heavy pieces were dragged on sleds. Scows completed the trip to the site.

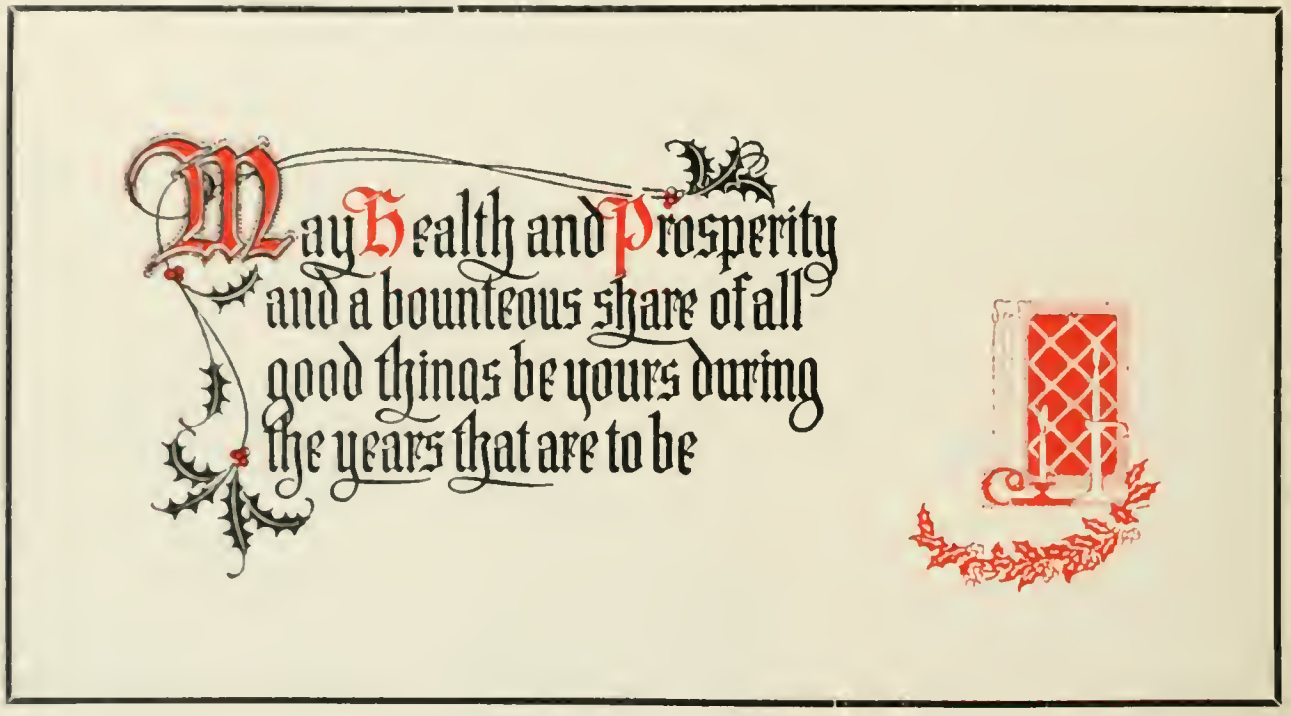
The Operation of Chatham's Refuse Incinerator

A Series of Questions and Answers That Outline the Nature of the Plant and the Results Obtained From It

By C. H. R. FULLER
City Manager and Engineer, Chatham, Ont.

We have so many requests coming from various municipalities, asking for information on the operation of our garbage and refuge incinerator, that we have prepared a list of questions and answers giving information exactly as the case is, so that the person asking for the information may have every conceivable question answered.

This city constructed the incinerator in November of 1922. Previous to that time it took about a year and a half to decide the location, and to get a type of incinerator suited for that location, and suited for local conditions existing.



The questions and their corresponding answers are as follows:

(1) What is the population of the city of Chatham? Ans. 16,000.

(2) Who collects the garbage from houses and hauls to plant—city or contractor? Ans. Contractor.

(3) How much does this cost per annum? Ans. $5,500.00

(4) Are the ashes collected independently of garbage? Ans. Yes.

(5) What is the nominal or rated capacity in 1 working day of 10 hours? Ans. 20 tons.

(6) What is the capacity as rated by manufacturer in 24 hours? Ans. 45 tons.

(7) Is the plant operated 24 hours or in the day time only? Ans. Day only.

(8) What was the first cost of plant complete without site? Ans. $30,184.85.

(9) How much did the furnace cost. Ans. 2 units at 10 tons—$10,791.00.

(10) When were the furnaces constructed? Ans. November 1922.

(11) Who constructed the furnaces? Ans. The Canadian Incinerator and Furnace Co., Toronto.

(12) Who constructed the building and general layout? Ans. Designed by city engineer's department and constructed by local contractor, Geo. W. Cutter Contracting Company.

(13) Who constructed the chimney? Ans. William Summerhayes, Rochester. It is a radial brick chimney 100 ft. high, and cost $2,792.00.

(14) What is the average temperature of furnaces used to incinerate? Ans. 1000° F. to 1300° F.; often as high as 1700° F.

(15) How much coal or fuel is required to bring furnaces to proper temperature? Ans. A fuel oil plant is used only in case a very bad garbage is delivered at the plant and in the summer time a rag soaked in fuel oil starts anything going.

(16) What is the fuel cost of incinerator per ton of garbage? Ans. In winter about 30c per ton; in summer, nothing.

(17) What is the amount of garbage destroyed each working day? Ans. 9 to 11 tons average except Saturday.

(18) Is any additional fuel required after furnaces have been brought to proper temperature? Ans. Usually no, sometimes in winter we use available fuel oil but total cost for fuel oil per month is only about $250.00.

(19) What do you do with the tin cans and clinkers which come out of the plant? Ans. Collect one load each two days and haul to dump.

(20) Are you as an engineer or citizen, favorable to the garbage incinerator having as central a location as possible to reduce hauling costs, or do you prefer a site at the city's edge with the accompanying higher hauling costs? Ans. We have been through this stage and have discovered that the public of a small city prefer to pay the higher hauling cost. Personally we think the plant should be in the centre of the city or as near there as possible.

(21) Have you had any complaints regarding the plant from adjoining residents or industries that were well founded? Ans. We have never had any complaint because there is no nuisance of any kind. The furnaces are operated very carefully, and cleanliness is insisted upon.

(22) Do you put ashes through the plant or do you dispose of these elsewhere as filling, etc? Ans. No. We do not put anything through the furnaces but garbage and combustible rubbish and tin cans.

(23) How many men do you use to operate the plant and what is their wage? Ans. One man at $100.00 per month.

Actual Experience With Winter Building

Speakers Before the New York Building Congress Show that Cold Weather Construction is Practicable and Profitable—Lower Prices and Higher Output Claimed

"With an expenditure of $3,863 for protection of workers and materials and for heating, there was a saving of $87,710 on a job which cost $750,000," stated J. W. Lowry, Jr., at a recent meeting of the New York Building Congress, during which he submitted that winter construction was both practicable and profitable. Giving details he said:

Considering the bricklayer production in the summer of 1922 as 100 per cent., in the erection of this job during the winter of 1922-23, the bricklayer production was 109 per cent. This last summer, the bricklayer production was 91 per cent. On this job, carried on during the winter, therefore, I produced 18½ per cent. more brick per day per man than I was able this last summer.

Bricklayers got $10 a day. The payroll was $28,150. If the work had been conducted this last summer of 1923, the dropping off in production, or in efficiency, if you so choose to call it, would have added $5,360 to the cost of bricklayers alone. If the bonus of $4 be included, that is $14 per man per day, the bonus would have cost $11,260 more. In other words, the brickwork on this job would have cost $16,890 in addition to the $28,150 actually paid. The payroll for bricklayers, carpenters, labor and engineers amounted to $130,667. If the work had been done last summer rather than the previous winter, the dropping off in production and the bonus award would have added $25,689.

In addition to the saving in labor on this job, the saving on materials and in sub-contracts amounted to $16,030 compared with prices in the summer of 1922. Between labor and the purchase of materials and subcontracts, then, there was a saving of $87,710 on building work which cost $750,000. To offset this sum, the expenditures for winter construction were: Temporary protection to labor and material, $871; tarpaulins cost $667, with a salvage of $442 net cost $225; temporary heat, $668; salamanders, $302; coke, $304; boiler attendants, $1,030; coal for boiler heating $150; temporary lighting, labor and service, $196, and snow clearing, $111. These are a total of $3,863, or about one-half of one per cent. of the total cost of the job.

Concrete Work is Practicable

That working with concrete during the cold season is practical from every standpoint was explained by W. J. Barney, president of the Barney Ahlers Construction Co. He said:

From our files, I have taken three typical contracts, and the amounts given under the total contract column are practically for the reinforced-concrete structure, the enclosing walls, sash and roof, in other words, for that part of the building which requires protection from winter winds, freezing and cold in the course of construction. Once the building is enclosed, the matter of heating for the finishing trades is comparatively simple, especially if the permanent heating plant has promptly followed up

		Cost of Protection	Percentage Costs
		$15,000	5
		5,800	1½
		6,400	6½

... general way, about 5 per ... the contract represents the cost for winter ...

... does not represent the true cost of ... the cost of this winter pro... ... present conditions of the ... and material markets, is more than offset by ... lower cost of materials during the winter, the ... premium paid to mechanics and the greater ... efficiency of mechanics under conditions when work ... not so plentiful.

Take the past year for example, we find that lumber purchased in June would cost approximately 10 per cent less if purchased in November. We find that timbers or 4-in. boards, which enter so largely into form construction, are purchased for $1 per thousand less in November than in August. We find that common brick entering into the curtain walls is purchased for $3 less per thousand in November than in August. We find that reinforcing steel is purchased for 7c. per hundred pounds less in November than in August, and we know that cement has had its seasonal drop.

Moreover, it is a matter of common record that during the past summer bricklayers were paid $14, $16 and $18 and even as high as $20 per day; that cement finishers were paid as high as $15 per day; that carpenters frequently received bonuses of from $2 to $3 per day, that all labor was scarce, difficult to obtain and very naturally not working at full efficiency under such conditions. We know that it is now possible to obtain practically all laborers and skilled mechanics, especially in reinforced-concrete construction at the established union rates, and that, moreover, the men are anxious and willing to work efficiently and skillfully and have interest in holding their positions.

Smaller Margin of Profit

A still more vital factor to be weighed is the selling psychology of the general contractor which always follows a definite seasonal trend. In the spring and summer when work is plentiful, the general contractor and the special contractor will invariably place upon his work a considerably larger margin of profit and contingency, justifiably so against the skyrocketing of summer costs. In the fall when work begins to become scarce and the contractor is confronted with the problem of holding his organization together during the winter months, he will invariably lower his percentage of profit and take work on a closer basis as to contingencies, appreciating that he will be able to manage, control and direct his work far more efficiently during the winter months than in the summer, and consequently, can operate safely upon a closer margin than when he does not know from week to week as during the summer months, whether mechanics' wages will increase two, four, six or eight dollars per day.

I have had an estimating department take from their files typical estimates and using these various factors, the same building would have been estimated in June or August at $210,000 and today for winter construction at $203,000, showing a saving to the owner of at least $5,000 or 2½ per cent, this including all cost of winter protection. Therefore, under present labor and material conditions, it is certainly conservative to say that winter construction costs no more than summer work.

A.C.B. & C.I. Convention in Windsor on January 22 to 25

The Association of Canadian Building and Construction Industries will hald its sixth annual convention at the Prince Edward Hotel, Widnsor, Ont., on January 22nd to 25th next. All interested in the construction industry of Canada are invited to attend.

One of the principal features will be an exhibit of materials and apparatus, arrangements for which will be in charge of Harry Mero, of "Truscon" fame. Here, the manufacturing and supply members will exhibit the newest wrinkles in equipment and be prepared to explain the advantages of their special products.

The daily luncheons will be again a feature, and on the evening of the 22nd, it is proposed to hold an informal smoker. Among the speakers already secured are Dr. W. I. King, of the U. S. Bureau of Economics, a noted authority on Immigration and Wages, and Gordon Tamblyn, of Denver, Colorado, who will explain his system of estimating, an original and effective plan.

It is hoped to have a special evening devoted to an apprentice competition, to which the public will be invited.

Asphalt Roofing Manufacturers Amalgamate

Announcement was recently made of the merger of the Canadian Roofing Manufacturing Co., Ltd., of Windsor, Ont., with the Brantforl Roofing Co., Ltd., of Brantford. Part of the Canadian Roofing Company's plant was destroyed by fire in the early part of August. The balance of the equipment has been moved to Brantford, where all manufacturing will be centred, and the plant at Windsor will be closed. A warehouse, however, will be maintained in Windsor, to serve the trade in that section. The company will be known as the Brantford Roofing Co., Mr. C. S. Jackson, who was general manager of the Canadian Roofing Manufacturing Co., becomes sales manager of the new organization.

The Windsor company were very large manufacturers of asphalt roll roofings. The Brantford Roofing Company were also manufacturers of asphalt roll roofings, besides being the largest manufacturers of asphalt shingles. The combined businesses will form it is stated, the largest manufacturer of asphalt roofings in Canada.

The Company state that they are at the present time installing some very modern roofing machinery in Brantford, which will greatly lower the cost of production, and make their plant one of the most efficient on the American continent. Mr. Chas M. Thompson, manager of the Brantford Roofing Co., retains the same position in the new company.

Pawling and Harnischfeger Appointment

The Pawling & Harnischfeger Company of Milwaukee, Wis., have recently appointed Mr. N. P. Farrar as their district manager with offices at 605 Stephen Girard Bldg., Philadelphia, Pa., and 50 Church Street, New York City.

A Problem that Demands Solution

Why Boys Do Not Enter Building Trades

Partly the Lack of Continuous Employment and Partly the Unpleasant Working Conditions—Some Suggestions as to the Cure for a Troublesome Situation

Under the caption, "Why Boys Do Not Enter the Building Trades," the Building Age publishes a statement of the present shortage of men in these trades, with suggestions of how to make the trades more attractive. That young men prefer to go elsewhere seems certain from the results of a questionnaire sent out by this paper. Only one third of several hundred youths, otherwise promising candidates, would express any interest in going into building. The trouble, we are told, seems to be partly the lack of continuous employment and partly the unpleasant working conditions, which the writer admits are antiquated compared with those in other industrial occupations. Still, young men of the right sort are needed in the building industry, and how to attract them is a subject of considerable concern to contractors. The article reads in part.

Lack of Foresight

We must look the situation squarely in the face. The present shortage of capable building mechanics can be laid directly to the lack of foresight of builders and the older mechanics themselves. We have recently been living in an age where the mechanic was looked down upon—a sort of cog in the industrial wheel. Men were known by numbers instead of by name, working conditions were primitive, comparatively nothing was done to interest young men in the different trades until we were face to face with the present serious condition.

Young men have been educated away from the different building trades, other callings have been made attractive, so they have comparatively little trouble in filling their ranks.

As Mr. Horowitz, the head of one of our biggest construction companies, said—the methods in use today in building construction are still primitive—most contractors expect men to work under conditions that do not exist in the worst of so-called sweatshop factories.

Why do not more young men take to some building trades? The work is healthful, outdoor labor, where skill and nerve are often required; it is the sort of work that should appeal to red-blooded American young men of good physique. One can have thrills enough, and to see a structure grow under you is interesting work—one is creating something.

The pay is good. There are many callings that pay less and that are in many ways less attractive; some are more dangerous, yet they do not have the trouble the building trades have in getting men. What is the answer? Let some of the young men speak.

By personal interview and questionnaire, Building Age obtained the first-hand, frank expressions of several hundred American young men, not now employed in a building trade. These were men whose ages were principally between 20 and 26, the most desirable ages for building recruits. Note that word it sounds better than "apprentice," or just indefinite No. 112," etc. Their average pay was $28.73 per week.

Now 33 per cent of these young men thought they would like to enter some one of the building trades, 58 per cent had no interest, and 9 per cent were doubtful.

Of the young men that thought about trying some of the building trades, certain preferences were made as follows:

Bricklayers	25%
Electricians	21%
Carpenters	20%
Tile-layers	11%
Plumbers	8%
Painters	5%
Plasterers	5%
Ironworkers	3%
Stone-cutters	2%
	100%

Perhaps, in another crowd of young men, the percentages would vary, but here is what was in the minds of a representative "bunch." The amount of pay is not the only thing that appeals—plastering looks a little unpopular, despite being one of the highest paid jobs.

Now comes the subject of preferring a 'white collar' job. These questions were asked of men principally in that sort of job, and yet only 25 per cent of them said that they objected to going to or from work in dirty clothes!

Some of the Reasons

And there we were thinking that our young men were looking down on any sort of a job where they could not be all dressed up. The reasons must be somewhere else. Here are some of the drawbacks that 143 had for not entering some building trade:

29 said no advancement seemed probable.
23 did not like the men they would associate with
21 had no interest in building.
17 were not mechanically inclined.
16 objected because the work was too dirty.
14 families objected to their working at a trade
12 would rather do office work.
11 preferred to work inside.

The greatest drawback that these young men see in working at a building trade, however, is that the jobs are not steady enough and that outside of the bigger cities, it is not possible to find steady work the year round.

To our readers of what is the greatest objection to working at a building trade, many answers were given. Here are a few terse ones showing just how the young men are thinking.

After you once learn the main points of your trade, it gives no opportunity for developing your mind further.

Unions ruled by wrong men and in favor of radical element.

What Must Be Done

Don't ask more facts and we publish them for what they disclose. It seems essential that a 12-months year be established in the building trades.

It will take some careful planning of work to bring this about. Builders must also educate the public so they know in just what seasons a certain kind of work is or is not permissible for the best interests of all.

Young men should be encouraged to enter the building trades—no construction job should go up without at least one recruit at work in each trade.

Provide safe working conditions for the men—carrying compensation insurance won't stop the pain an injured workman suffers.

Provide a decent work-house with lockers where a fellow can keep his good clothes while he is on the job in comfortable work clothes.

Let the locker-room be kept clean and provided with drinking water, wash-basins, soap, towels, and mirror. Don't forget to have a first-aid outfit.

Some of the primitive arrangements at certain building operations would disgust an aborigine; then why think that a twentieth-century American will submit, while in other occupations he works under better conditions?

It seems that builders have unconsciously, however, driven the young men away from the building trades. Now the big job is to get them back. Sensible co-operation of contractors, workers and public will do wonders."

Letters to the Editor

Some Fallacies in Determining Cost of Hauling Western Coal

Toronto, December 12, 1923

Editor Contract Record

It is impossible for me to agree with the fundamental use of train-mile cost upon which Mr. Butler has built up his calculation of $5.75 rate on coal from Alberta to Toronto (Contract Record of Nov. 14, page 1073). The train mile cost is such an unreliable element that it cannot be used with any degree of accuracy. It is too much of a hybrid to yield any scientifically true results. It includes all trains in all directions—passenger, freight, mixed, branch line, main line, revenue and non-revenue, westbound empty cars as well as east-bound loaded trains. Such a composite figure applied to the movement of a single commodity in one direction could not furnish an adequate guide as to the rate to be charged.

Moreover the calculation which we have had placed before us does not take into account the west-bound movement of empty cars, nor anything which should be charged for the maintenance of the equipment and the property. Nothing is added for terminal expenses nor for interest on the capital tied up in the rolling stock. No provision has been made for depreciation. Nothing in the way of fixed charges has been brought into the account and yet these constitute on the average ten to fifteen per cent of the total outlay of the Canadian railways. When it is remembered that, in 1922, for every loaded car moved 100 miles for the entire year's traffic an empty car was moved 45 miles; that in this coal movement the empty car movement would be practically 100% of the loaded movement and that the loaded car movement should pay the high expense of the empty car movement—with these considerations in mind it is manifest that the $5.75 rate per ton is very much too low. I should commend the system of computing this cost as established by the Canadian Pacific Railway and the Canadian National Railways as very much more scientific, in fact, as close as we can get to the actual cost of transportation, and when the former reaches a figure of $9.95 and the latter $9.03 we can see how wide a disparity there is between the estimates of these two railways based upon actual experience and the figure based upon train-mile costs. A much more accurate basis of consumption, and to my mind the only proper basis, is the cost per loaded car mile, and against the loaded car movement—the revenue producing movement—there would have to be assessed the costs of transporting the empty cars westward.

Then, too, any theory on starting a solid train of any given number of cars from the mines of Alberta either at Lethbridge or Drumheller, to a destination in round numbers 2,000 miles distant is one upon which little reliance can be placed. Different gradients along the line alter the engine power.

Different classes of engine power have to be assigned to different sections. For instance a Canadian Pacific 210% engine would haul 3,100 equivalent gross tons from Lethbridge to Dunmore, but from Dunmore to Swift Current only 2,700 tons. A 155% engine would haul 2,116 tons from Moose Jaw to Broadview, but it would haul 2,685 tons from Brandon to Winnipeg and from Mac. Tier (Muskoka) to Toronto only 2,000 tons.

Reference has been made in the discussion upon this paper to the desirability of being freed from the coal supply of the United States and in order to be freed from this economic dependence upon Pennsylvania anthracite, it has been suggested in all seriousness that if it is necessary, in order to secure this result, the National Railways should be required to carry Alberta coal to eastern Canada at less than cost. I should view with alarm any such attempts to obtain the carriage of coal at less than cost, for several reasons. In the first place, if the National Railways put down the rate below cost the Canadian Pacific would have to follow suit and it is not difficult to see that this would mean disaster to the private company. In the second place, we are endeavoring to make lines under their control a paying system; but nothing would more seriously undermine the initiative and enthusiasm of the management in their efforts than to be compelled to carry traffic at less than cost. In the third place, if the Canadian National Railways had to carry this coal to eastern Canada at less than cost, the deficit would have to be made up from the Dominion taxes and it would be

unjust to tax all parts of the country in order to provide a less-than-cost service to one particular part of the country.

Yours very truly,
(Prof.) W. T. Jackman
University of Toronto.

Claims that Bonding Companies Are Not Responsible for Worthless Contractors

Toronto, Dec. 8, 1923

Editor, Contract Record.

There have been several items of criticism in various journals recently, endeavoring to place the blame upon the bonding companies for the existence of many worthless contractors. It is quite natural, I suppose, to judge all the surety companies by the actions of two or three of the irresponsible companies, who turn up now and again, and will keep on turning up at intervals for all time to come. But is it quite fair to the companies of long experience who have been operating for many years, who do all in their power to keep the contracting business on a high level, that they should be held responsible for the actions of these fly-by-night companies?

Having been in the bonding business for over twenty years, I have some knowledge of the conditions in Canada and my answer is that if the contractors would establish themselves with a bonding company of some substance and not listen to every agent that comes around offering to cut his rate by five or ten cents, they would be helping to keep the contracting business where it should be. Would a contractor deem it wisdom to keep jumping from one bank to another, because one offered him loans at one half per cent less? Is it not usual and wise to establish yourself with a bank of some standing in the community, who would gain confidence in you from year to year, and accommodate you according to their knowledge of your ability, so that you would benefit in the end? A reliable bonding company will treat you properly and give you a line of credit and very often also give useful advice, and you will be better served in the end than if you place your confidence in some small company whose representatives call around at your back door offering to write your business a little cheaper if you do not tell anyone, and so on.

Such companies are not doing the contracting business a service and their doors are wide open to any and all contractors who might walk in. If the contractors will stop doing business with these firms and link themselves with one of the companies who understand the business and appreciate the liability they are assuming, the sooner such firms will be carrying on business on legitimate lines, or will be forced out of business, and then it will be impossible for undeserving contractors to obtain bonds.

There are dozens of bonding companies operating in America, companies who have the courage to say to a contractor, "You should not bid on this job, it is out of your line," or "You have a sufficient amount of work on hand according to your finances." These are the companies you should deal with; they make a fair charge for their services and the risk they undertake—a charge based on their experience of many years, and one which enables them to make a fair profit. Perhaps, therefore, the blame should not be placed on the bonding companies generally but only on a few of them and the contractors themselves, for it is within the power of the reliable contractors to remedy this condition.

Remember, too, that the premium is indirectly paid by the owner and he is not objecting to the charges made, but he does object to the contractor putting in one rate in his tender and then shopping around for lower rates at his expense and offering inferior security, not only inferior from a financial standpoint, but the security of a company without experience in the contracting field and of one that has not gone to the expense of employing capable engineers to give advice when trouble arises. The possibility of any contractor being able to get a bond is apparent, but such bonds are only obtained from new companies in the field, companies who cannot obtain business by honest methods. Knowing that the other companies are charging the same rate to everyone whether rich or poor, they are in a position to play against honest competitors.

Stanley Moss
Manager, Fidelity Agency of
Canada, Ltd., Toronto.

Unfair Treatment of British Tenderers is Prejudicing Them Against Canada

Toronto, December 6, 1923

Editor, Contract Record:

At a recent meeting of the executive council of the Canadian Association of British Manufacturers, the matter of the acceptance by public bodies of the lowest tenders for advertised contracts, was discussed. On several occasions recently, manufacturers of the Old Country who have bid for Canadian contracts, in response to public advertisements for tenders, have received little encouragement despite the fact that their prices were the lowest received and the quality indisputable. The following actual cases are noted below, the names of the public bodies and the firms tendering being omitted for obvious reasons:—

(a) An English firm tendered for goods required by a public body in the province of Quebec. Their tender was 20 per cent lower than a local bid. Much delay occurred in considering the tenders and finally facilities were given so that the local bid could be reduced by no less than 25 per cent. and the bid so reduced secured the order. The English firm's specifications were also partially used by the local firm to build the equipment required under the contract.

(b) An English firm tendered for goods required by a public body in the province of Ontario. Several of the highest tenders were rejected but one of them was allowed to remain in competition with the bid of the English firm, which was by far the lowest received. The decision was postponed from meeting to meeting and then given in favour of the English firm. After active work on behalf of the Canadian firm, the decision to award the contract to the English firm was actually reversed and the firm who had bid a much higher price was in effect allowed to revise their tender in order that they might secure the business.

This association has every proper sympathy with the desire of public bodies in Canada to award their contracts to Canadian firms but believes it is a sound business principle that public bids should be dealt with according to the spirit in which they were

the cheque being frequently for a large sum and the money in the meantime being unavailable for their general business purposes. If a public body refuse to give them fair consideration, then prior announcement that British tenders are not desired, should be made. That would at least save British firms the unnecessary expenditure of considerable time, labor and money.

(e) The refusal to throw open public tenders and to treat bids in a fair manner, stifles competition and has the effect of enhancing prices to the detriment of the purchaser and of the public.

The subject of this letter is one which vitally interests the members of this association, many of whom are native Canadians. Many of them also are called upon from time to time to advise their principals in the United Kingdom in regard to such matters as the establishment of branch factories or warehouses in Canada, the purchase of raw materials here, the desirability of advertising their products in the Canadian press, and so on. Upon these and other matters, the treatment by public bodies in the Dominion, of the tenders received from British firms in response to public invitation, naturally has an important bearing.

Yours very truly,
G. T. WILSON,
President, Canadian Association
of British Manufacturers.

Concrete Tanks for Railway Service

While They Have Been Found Satisfactory for Water Supply Purposes, There Are Still Some Features that Need Development—No Fundamental Objections to Concrete

Concrete water tanks constructed on railroads to date have followed four general designs, so far as the tower, floor and walls are concerned. These designs are briefly as follows:

1—The standpipe type of tank with the floor or bottom of the tank at or near the top of rail and utilizing the entire height of the structure for the storage of water.

2—A cylindrical shell forming both the tower and walls of the tank with a diaphragm or floor placed at the desired height in the shell with a central pier or column to assist in supporting the floor. In some cases the central column has been eliminated, the floor being made self-supporting in the center.

3—A cylindrical shell as above, forming both the tower and walls of the tank and a hemispherical bottom.

4—A tower consisting of columns and a floor system of girders supporting a flat bottom and straight cylindrical walls.

Concrete water tanks now in service represent as many designs as there are tanks in service. Apparently in many cases almost as much attention is devoted to the appearance as to the utility. This is particularly true of tanks designed for municipal and other public water supplies. While the question of appearance has not been entirely ignored in the construction of concrete railway water tanks, with a few exceptions the concrete tanks in service are no more pleasing to the eye than the familiar steel or wooden water tanks, although the attractive appearance of the concrete tank is one of the principal arguments advanced in its favor.

Lack of Uniform Design is a Disadvantage

The lack of a uniform design of concrete water tank that would overcome the existing faults resulting in cracks in the concrete, seepage and other leakage has probably reacted against the concrete tank as much as anything else. A standard uniform design of tank would undoubtedly result in materially reducing the cost of construction and would bring this type of tank into closer competition with tanks of other types. The concrete tanks that have been erected represent nearly as many different designs as there are tanks, with the result that it is almost impossible to make a comparison of tanks under varying conditions of service, while an intelligent estimate of costs is practically out of the question.

Some designs have apparently overcome one fault only to develop another. Practice on different railroads varies widely as to design of tower and tank, thickness of floor and wall, reinforcing and method of placing, forms, mix, aggregate and method of construction and until some design of tank is developed and adopted that will be uniform, at least in general principles, progress will necessarily be slow.

In the development of a railroad property it is frequently necessary to move water tanks, and from the nature of their construction concrete tanks cannot be moved. Thus, the permanence of the concrete tank, while used as the principal argument in its favor, is at the same time one of the principal ob-

jections to its use in many cases, for while it is undoubtedly permanent in every sense of the word, there is always a question as to the permanence of the railroad, in location at least, and changes in road may take place that will result in the concrete tank becoming useless within a few years. Where a steel or wooden tank could be moved to a suitable location at considerably less than the cost of a new tank, the concrete tank is not only useless but will probably entail considerable expense for wrecking.

Frequent Change of Location

As an example of the changes that occur in the location of water tanks, a study of 540 tanks in service on a middle western railroad shows that the location of only 56 has remained unchanged in 25 years. While of course many of these have been renewed on account of age it has been advisable to change their location in frequent instances. This serves to emphasize the necessity for the careful selection of a site that will not be affected by future changes and improvements. Very few railroad water stations can be considered permanent because experience has shown that operating conditions are constantly changing, requiring frequent and unexpected changes in yards and tracks.

Therefore, the erection of a concrete tank is inadvisable unless the location is known to be permanent beyond the possibility of a doubt. Thus, in a great many cases where the territory traversed by the railroad is not fully developed or where the water stations and line of road are not firmly established a concrete tank cannot be considered as a serious competitor of steel and wooden tanks.

The difficulty of obtaining a permanent location for a tank that will not be affected by changes in road or structures is probably the most serious objection to the extensive use of concrete tanks on railroads.

Cost of Concrete Tanks

It is extremely difficult to obtain any cost data on concrete railway water tanks that are applicable to average conditions or that can be used as a basis for estimates or comparison with other types of tanks on account of the wide difference in designs and the limited number of tanks in service.

It is obvious that concrete tanks will cost more at the present time than steel or wooden tanks of the same capacity, not only on account of the materials involved and the amount of labor required for construction but also on account of the expensive form work which is in some cases specially designed for each job and adds very materially to the cost. The additional foundation required for a concrete tank is also a factor affecting the increased cost over tanks of other types, as the weight of the concrete tank exclusive of the water, is much greater than that of a steel or wooden tank. Factors affecting the cost of concrete tanks other than design are the thickness of wall and the character of concrete, such as mix, aggregate, etc. The amount of reinforcing required in the construction of a 100,000-gal. tank varies in different designs from 14,000 lb. to 26,000 lb.

From the best figures available the cost of a 100,000 gal. concrete tank erected prior to 1918 ranged from $5,000 to $7,500. In all probability these tanks would cost considerably more at the present time. Estimates received in 1920 from a contractor making a specialty of concrete tanks placed the cost of a 100,000 gal. tank of the cylindrical type with an over-all elevation of 62 ft. between $8400 and $10,000. The cost of a 100,000 gal. steel tank varies from $5,000 to $5,500 and of a wooden tank of redwood it varied from $4,000 to $4,500.

The cost of concrete tanks is probably a factor which has contributed in no small part to limiting their construction on railroads. The question of cost will continue to have its effect upon the construction of concrete tanks until uniform designs and methods of construction are developed to such an extent that the cost will be reduced to compare more favorably with tanks of other types.

Conclusions

It has been demonstrated conclusively that it is possible to produce concrete that is impervious to water, at least to the extent required in a railway water tank.

No inherent fault has developed in concrete that would make it unfit for the storage of water and there does not appear to be any reason why it should not prove satisfactory for this purpose if the tank is properly designed and constructed.

There are certain features in the construction of concrete tanks that will have to be given further consideration, however, before the concrete tank can be considered with tanks of other types, chief among which is the question of design. There is no uniformity in design in tanks that have been constructed, which has kept the cost of tanks at such a high point that they have not been considered seriously in comparison with steel and wooden tanks. It is not the thought that a standard design of tank should be adopted to fit all conditions, but certain principles of design will have to be agreed upon before the concrete tank will come into general use. Such a design should be aimed to bring the cost of the tank into competition with other types of tanks and provide against leakage, both through porosity or through shrinkage or expansion of the concrete, resulting in cracks.

The difficulty in establishing a location that will be permanent and that will fit in with the development of a railroad property is one of the principal obstacles to the adoption of concrete tanks and their construction will be limited to installations where the location is known to be permanent beyond a doubt.

The first cost is another serious handicap to this type of tank as the investment required does not compare favorably with that of other types of tanks in spite of their acknowledged permanence and low cost of maintenance.

While the concrete tank will no doubt in time find its place in railway water service, it has not yet been developed to the extent that it can be recommended for general use. This statement is not based upon any specific objection to concrete as a material for water tanks as no fundamental objection may be offered against its use for this purpose.—By C. R. Knowles, superintendent of water service, Illinois Central Railroad, before the American Railway Bridge and Building Association.

Largest Single-Arch Bridge

The largest single-arch reinforced concrete bridge in the world has been opened to traffic in France. It is the 450-foot span over the Seine at St. Pierre-le-Vauvray, just completed

How Should Lime Plaster Be Applied?

Standard Specifications Covering Two and Three Coat Plaster on Wood and Metal Lath

Three-Coat Lime Plaster on Wood Lath or Metal Lath on Wood Furring

32. The mortar shall be a mixture of lime paste or putty prepared from properly slaked quicklime which has been allowed to age either neat or sanded for at least three (3) days, or hydrated lime, with sand, hair, etc., in the following proportions:

Proportions for Three-Coat Lime Plaster on Wood Lath

Scratch Coat	Brown Coat
Stiff lime putty	Stiff lime putty
Plastering sand	Plastering sand
Hair or fibre	Hair or fibre
1 part by volume	1 part by volume
2 parts by volume	3 parts by volume
1 bu. per cu. yd. of sand	½ bu. per cu. yd. of sand

Finish Coat

For various finish coat proportions, see section 49.

33. Plastering shall be to seven-eighths (⅞) inch grounds.

34. (a) Apply a one quarter (¼) inch coat of mortar with sufficient pressure to make a good key at the back of the lath.

(b) As soon as this first coat has become firm, but not fully dry or hard, the entire surface shall be cross scratched diagonally. Scratching shall be deep enough to provide good bond for the following plaster coat, but not deep enough to injure the keys. When this coat is dry apply the second coat.

35. (a) Apply sufficient brown mortar to bring the plaster surface out to grounds. Rod, darby and float the entire surface to a true even plane.

(b) This coat shall be well worked. The surface shall be left sufficiently rough to provide good bond for the finish coat. When the second coat is dry, apply the finish coat.

36. For finish coat specifications, see section 49.

Three-Coat Gauged Lime Plaster on Metal Lath on Metal Furring

37. The lime putty, sand and hair in the following proportions shall be thoroughly mixed by machine if possible. If hydrated lime is used the materials may be mixed by hand if desired. Just prior to delivery to the plasterer the proper amount of gauging cement shall be added and well worked in. No more plaster shall be gauged with cement than can be applied within one and one half (1½) hours after the cement is added.

Proportions for Three-Coat Gauged Lime Plaster On Metal Lath

Scratch Coat		Brown Coat	
Stiff lime putty	80%	Stiff lime putty	90%
Gauging cement	20%	Gauging cement	10%
Plastering sand		Plastering sand	
Hair or fibre		Hair or fibre	
1 part by volume		1 part by volume	
2 parts by volume		3 parts by volume	
1 bu. per cu. yd. of sand		½ bu. per cu. yd. of sand	

Finish Coat

For various finish coat proportions, see section 49.

39. Plastering shall be to seven-eighths (⅞) inch grounds.

40. (a) Apply a one-quarter (¼) inch coat of mortar with sufficient pressure to make a good key at the back of the lath.

(b) As soon as this first coat has become firm, but not fully dry or hard, the entire surface shall be cross scratched diagonally. Scratching shall be deep enough to provide good bond for the following plaster coat, but not deep enough to injure the keys. When this coat is hard, apply the second coat.

41. (a) Apply sufficient brown mortar to bring the surface out to grounds. Rod, darby and float the entire surface to a true, even plane.

(b) This coat shall be well worked. The surface shall be sufficiently rough to provide good bond for the finish coat. When the second coat is dry, apply the finish coat.

42. For finish coat specifications, see section 49.

Gauged Lime Plaster for Solid Plaster Partitions

43. The lime putty, sand and hair in the following proportions shall be thoroughly mixed by machine if possible. If hydrated lime is used the materials may be mixed by hand if desired. Just prior to delivery to the plasterer the proper amount of gauging cement shall be added and well worked in. No more plaster shall be gauged with cement than can be applied within one and one half (1½) hours after the cement is added.

Proportions for Gauged Lime Plaster for Solid Plaster Partitions

Scratch Coat		Brown Coat	
Stiff lime putty	80%	Stiff lime putty	90%
Gauging cement	20%	Gauging cement	10%
Plastering sand		Plastering sand	
Hair or fibre		Hair or fibre	
1 part by volume		1 part by volume	
2 parts by volume		3 parts by volume	
1 bu. per cu. yd. of sand		½ bu. per cu. yd. of sand	

Finish Coat

For various finish coat proportions, see section 49.

Note. Type of partition desired should be specified by the architect in accordance with the directions of the manufacturer of the partition chosen.

44. Plastering shall be to seven-eighths (⅞) inch grounds.

45. (a) Apply a one quarter (¼) inch coat of mortar to the face of the metal lath with sufficient pressure to make a good key.

As soon as this first coat has become firm, but not fully dry or hard, the entire surface shall be cross scratched diagonally. Scratching to be deep enough to provide good bond for the following plaster coat, but not deep enough to injure the keys.

46. When the scratch coat (which is applied to only one face of the wall) is hard, apply the second coat.

47. (a) Apply sufficient brown mortar to both faces of the partition to bring the surface out to grounds. Rod, darby and float the entire surface to a true, even plane.

(b) This coat shall be well worked. The surface shall be left sufficiently rough to provide good bond for the finish coat. When the second coat is dry, apply the finish coat.

(Continued on page 1214)

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Building Restrictions and Public Rights

Last week, after considerable juggling of decisions, the city council of Toronto finally refused to amend the building by-laws so as to permit the erection of a large and costly apartment house in a district of the city restricted to the building of private residences only. The incident is important, chiefly, as indicating to what extent political influences can dominate public bodies and set aside popular will. While it is true that in this case the final decision of the council vindicated the wishes of the people whose rights were in danger of being trespassed, there were times during the discussion when influences brought to bear on the council nearly brought victory to those who would circumvent the exercise of just rights.

Stripped of all its localism, the matter still has an important general significance. When persons buy property in a restricted district they actually pay something for that restriction because it were not imposed quite as high a price could not be commanded. They pay this higher price on the reasonable supposition that their investment will be amply protected and because of the guarantee of protection the whole district assumes a high-class atmosphere quite in accord with the intentions of those who were responsible in the first place for the restrictions. When these restrictions are removed, through action of a municipal council, without the consent of the property owners of the district, it is clearly a case of breaking faith, for which the property holders would in our opinion, be fully justified in demanding compensation.

In the particular incident referred to the organization that proposed the erection of the apartment house, attempted to force through the council an amendment to the by-laws in the face of strenuous opposition from the citizens of the district. Desirable or handsome as the apartment may have been the property owners were within their just rights when they insisted that their consent must be obtained before restrictions, for which they had really paid something, were removed. They argued quite logically that the erection of a type of building other than that for which the district was limited, injured the property and affected the investment made in it.

The city council did right in finally refusing to make any change in the by-laws. It is clearly a matter, because of their heavy interest in it, for the ratepayers of the district to determine. Circumstances may change in such a way as to make the removal of restrictions desirable. When that does happen, the property owners will be ready to accept an alteration in the character of their properties.

The Wrong Time to Patronize Home Industry

The Municipal Research Bureau, in a letter addressed to the mayor and city council of Toronto, directs attention to the serious injury that it considers is likely to result from the rejection of the lowest tender for the supply of cast iron water mains. It says many citizens and taxpayers learned with surprise and grave concern that the council failed to support the lowest tender system. The referring back of the matter to the board of control "to enable the latter if possible, to arrange for a price that would enable the work to be done in Toronto," in the opinion of the Bureau, was not only "unsound business practice, but a breach of ordinary ethical standards." It goes on to say that the advisability of restricting Toronto city contracts to Toronto firms is a matter of policy which may be open to discussion, but the desirability of the preservation of a deserved reputation for straightforward business conduct is not a matter for discussion.

The time to adopt the policy of patronizing home industries only was before tenders were called for. When that was not done and tenders were invited without limitation, the lowest tenderers had every right to expect fair and equitable treatment. In presenting its views on this matter the Bureau declared that whatever policy might be adopted in the future that in the present instance of supplying cast iron water pipe, honorable dealing demanded that the con-

The Need of Winter Construction

By FRANKLIN D. ROOSEVELT

When winter comes, construction men know that spring is not far behind. Unfortunately through the years the idea became fixed that the winter season was disadvantageous to successful prosecution of construction projects. But winter construction has been done, can be done and should be done.

In the early days of the country's development, when time was less essential than it is today and when our industrial situation was less complicated, it was seemingly justifiable to defer building until climatic conditions made matters a little easier. In our present rapid age when our vast population consumes the limit of production in many lines, construction cannot afford to doze in the atmosphere of mid-Victorian non-aggressiveness.

There is the possibility of a volume of construction for 1924, if present indications are sound, equal to if not greater than for 1923. Realising this the American Construction Council recently urged all those interested in essential building projects in the near future to undertake such work at as early a date as possible in the fall or spring.

If winter is to bring a lull in meeting the demand for construction, next spring will find the construction industry confronted with problems of shortage in materials and labor, transportation difficulties, and a rising market that will seriously interfere with its progress. If that occurs the public will be forced to incur costly delays in getting needed improvements and run the risk of higher if not prohibitive prices.

The advantages of uninterrupted construction throughout the year must be apparent to everyone. Whether used as an ameliorative on transportation problems, or as an aid to continuity of employment, or as a necessity in stabilizing production of materials, or as an effective contribution to the public demand for construction projects, every day added to construction is of incalculable value.

Notable instances of major operations conducted during the fall and winter months during the past year or two with savings in construction costs ranging as high as ten per cent show the practicability of winter work and the benefits immediately accruing to individual owners and the public as well as to builders and labor on the job.

The country's need today is very acute. The construction industry must stand or fall in its obligation to the public as it meets that need or fails to meet it. It must have the help of those who contemplate building or other construction projects if it is to meet this need. Every day lost means an added accumulation to the growing demand.

The large volume of construction contracted for and already started during the fall months shows that the public has thus far responded favorably in undertaking winter work. But more winter work should be done. Let every prospective builder who contemplates necessary construction during the coming year go ahead now with the work.

The Week's Developments in a Nutshell

As the New Year approaches, strong objection to the new 6% sales tax is developing. One of the claims being pressed is that the pyramiding of this tax will increase the cost to the consumer unduly without any gain to the government coffers. For example, a manufactured article invoiced by the manufacturers at $100.00 will carry a $6.00 tax and cost the wholesaler $106.00. If the wholesaler adds 20% the cost to the retailer is $127.20; and if the retailer adds 50% the cost to the consumer is $190.80. Now, if the 6% tax had not been added to the manufacturer's invoice the cost of this same article would have been $120.00 to the retailer and $180.00 to the consumer. If we now add the government tax of $6.00, the final price to the consumer would be $186.00. We thus see that by the present method of collecting the tax the consumer will pay the difference between $190.80 and $186.00, i.e., $4.80 extra.

In other words the consumer pays $10.80 so that the government may receive revenue to the amount of $6.00.

The turnover tax which is now being widely advocated is open to the same objection of course, but that the tax rate would be very much lower, to yield the same total revenue, the total amount of the pyramid would be almost negligible by comparison.

The force of this argument on pyramiding can scarcely be over emphasized. An increase in the cost to the consumer reacts immediately and directly on general business. Not only does it reduce the consumer buying power but it reacts further by reducing turnover and thus further increasing cost of doing business all along the line. It looks as if the government had not sufficiently considered this phase of the tax problem.

With the approach of Christmas, retail trade is looking up but the holiday lines are profiting most. Fear is experienced in some quarters that the mild weather will have the effect of inducing people to spend their money on non-essentials and luxuries rather than on the more necessary and sensible gifts. Unemployment is not much in evidence, particularly in the construction field, and this of course will have a favorable effect on general holiday business.

The prospects all over Canada seem to be that we shall have the happiest Christmas in many years.

Hints for the Contractor

Gasoline Shovel Wades Down River to Site of Work

A very interesting stunt was recently pulled off with a 22-ton shovel by the Dells Paper & Pulp Company of Eau Claire, Wisconsin, on their new dam construction job. In order to speed up the excavation work so the foundations could be poured before freezing, they had purchased a Pawling & Harnischfeger 3/4 yd. gasoline shovel.

Their dam was at a point in the river where there was a high bluff on each side. They had originally figured that it would be necessary to dismantle the machine and skid the parts out onto a platform, from which it would have been lowered by derricks a distance of seventy or eighty feet and reassembled. This would have taken at least a week's time and much labor, besides the continued payment of wages to twenty or thirty shovelers whose work the machine was to do.

The manufacturer of the shovel, hearing of this condition, and desiring to be of service to the purchaser of the machine sent an engineer to look over the job. His report was that the machine could be run into the river about a quarter of a mile below the

Unique way of getting a P. & H. shovel to the job

dam and moved under its own power to the cofferdam. This seemed unbelievable to the owners, knowing as they did the treacherous condition of the river bottom, it being full of deep holes and ledges.

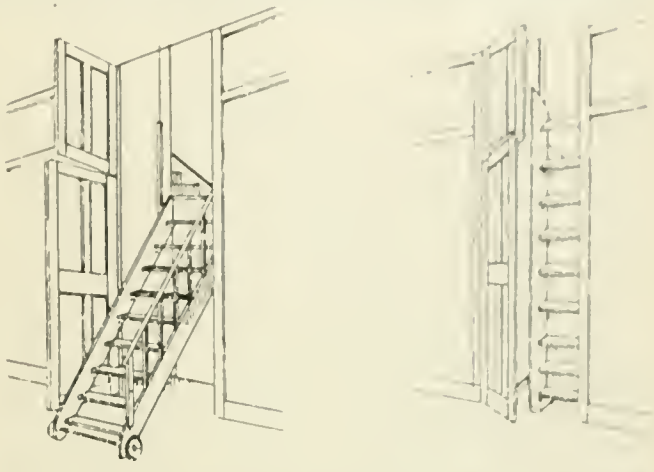
However, with the assurance of the builders they decided to take a chance. The machine was started into the river at eleven o'clock on Saturday with three men aboard, and began its journey.

Many times during the trip it looked very bad to the watchers on the bluffs. The machine ran over ledges and would rear up like a duck taking a dive. Other times it would run into holes which could not be avoided, and the water would almost reach the magneto and carburetor, the current getting swifter as the machine neared the dam.

After hours of negotiating through the swift black water, during which time the machine behaved perfectly, in spite of the hardship thrust upon it the cofferdam was reached. Another hour to reinforce the planking and supports and the machine came up out of the water like a huge hippopotamus, crawled over the dam and down into the hole 12 feet below. It took just five and one half hours for three men to do the trick.

An Economical Staircase

A London, Eng., architect has designed a staircase suitable for small houses where space is too valuable to be lost or is lacking for a proper staircase. The diagrams show how this has been attained, and



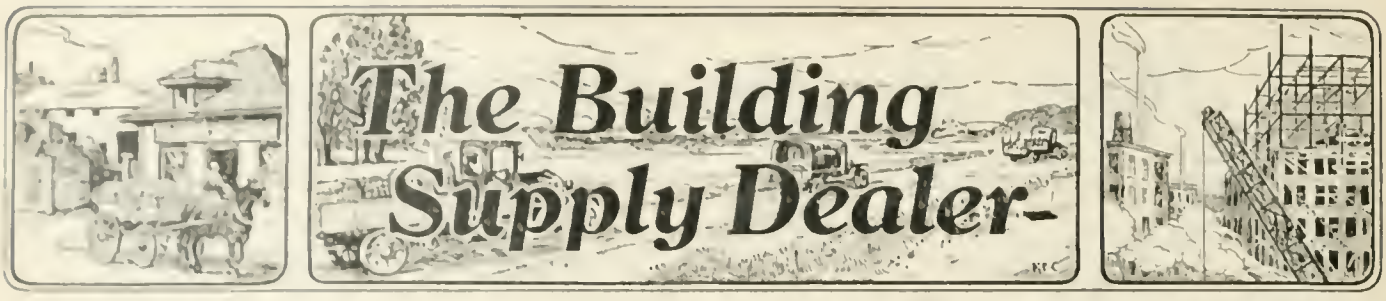
the invention should be extremely useful as an escape stair to the roof as well as for mere stair purposes. It is being taken up by people interested in smaller houses.

Repairing a Lift Span Bridge

The counterweight cables of the Halsted St. lift bridge in Chicago were renewed in 1922 after being in service 28 years. F. H. Avery, engineer of bridge maintenance, in the latest annual report of the city engineer makes the following reference to the work:

The cables were in good condition, except at the lower end where they were fastened to the top chord of the span. At this point they pass through a long clamp and around a pin. Upon removal, the portion passing around the pin was found to be in a dangerous condition with about one-half of the strands broken, the ends of these strands being corroded until they were as sharp as needles.

The work was done without interrupting traffic, the span being closed to river traffic for the time necessary to change two cables each on two diagonally opposite corners. This change at first took 10 days, but this time was reduced finally to 4 days. Sixteen cables were changed in all and work continued in zero weather, accompanied by high winds, which speaks well for the mechanics. This winter work was made possible by building shelters for the men at the tops of the towers. During the periods the span was closed to navigation, work was carried on continuously with two 12-hour shifts, which, of course, increased the cost [illegible] the work.



From One Account to One Hundred and Fifty in Seven Months is Doolittle Russell's Record

A Hamilton, Ont., Firm, Only Established in April, Already Handles 700 Tons of Materials a Day—Strict Attention to Contractors' Requirements Has Built up the Business

When a building supply firm in the first seven months of their existence can increase the number of their accounts from one to 150, handling during that time over 2,200 cars of materials and can attain a daily production on the average of 700 tons, their record is nothing short of phenomenal. Yet that is just what Doolittle Russell Ltd., of Gage Ave. North, Hamilton, Ont., have done since they were established on April 1 last. Starting out with no yard and only one order from the civic works department, they have succeeded in a comparatively short time in developing a remarkably voluminous business and in establishing a yard and plant that, for appearance, layout and efficiency, is unsurpassed, it is believed, by any other building supply yard in Canada. This has been accomplished by a clear recognition at the start of the type of service that contractors require and by an earnest attempt to meet these requirements as completely and in as efficient a manner as possible.

That the business was established in the first place was due to the foresight of two gentlemen well known for their long connection with the construction industry in one capacity or another—C. M. Doolittle, president of the Canada Crushed Stone Corporation Ltd., of Dundas, Ont., and John E. Russell, president of the John E. Russell Co. Ltd. and the Russell Construction Co. Ltd., of Toronto, Ont. Both of these men, appreciating Hamilton's industrial importance and the consequent construction development that should continue to take place there, felt that there was need in that city of nearly 150,000 people for a thoroughly up-to-date builders' supply yard that could guarantee a service par excellence. With this thought in mind, then, they initiated the venture, putting into it the results of the long experi-

Mr. Geo. A. McHaffie, the manager of Doolittle Russell Ltd.

Pleasing surroundings and an entrance as to force enlargement of this office. A neat fence, a trim lawn and well kept flowers make the plant an asset to the neighborhood

The yard of Doolittle Russell Ltd., is arranged for the speediest possible handling of materials. Steel bins are the latest word in permanent equipment

ence which both Mr. Doolittle and Mr. Russell had acquired from their respective connections with the construction industry. So, about the first of April last, the firm of Doolittle Russell Ltd. took shape and, as intimated previously, with one order from a civic department, commenced active business. With no loss of time, the company laid out a yard and established an office and in this way firmly entrenched themselves as an important element of the industrial life of Hamilton. Thus, throughout the busy

A substantial Frost wire fence adds to the appearance of the yard and protects it against intruders

building season, Doolittle Russell Ltd. were prepared to supply and did supply all the needs of the contractors of the city, with a promptness that met with high favor.

Volume of Business Has Necessitated Expansion

It is worthy of comment that, unlike so many new concerns, Doolittle Russell Ltd. did not venture into the building supply business in a small way and expand only as the growth of business warranted. A policy of that sort generally leads to the development of those scraggly, unattractive, patched up supply yards that are characteristic of so many of our towns today. Rather did Doolittle Russell Ltd. undertake to establish right at the start the very best their resources could command, confident that business would come when the facilities were there. The experience of the past eight months has served to justify that policy and today the firm are confronted with the necessity of enlarging their office in order that they may maintain, as they desire to do, their facilities always a little in advance of current requirements. Doubtless, this policy has contributed very substantially to the very remarkable growth of business that has developed since the firm's inception.

Reference has been made more than once to the unusually excellent facilities which Doolittle Russell Ltd. have established and in two of the illustrations an attempt is made to picture them, although the photographs hardly do justice to the yard. It will be noticed, however, that the whole plant has an extremely clean-cut appearance with order and neatness permeating everywhere. In the first place, the firm were solicitous of the feelings of the residents of the neighborhood, who might have objected to the establishment of a building supply yard in their vicinity. Consequently, a very neat Frost wire fence, of substantial build, was erected around the site and the lawn fronting on Gage Ave. was sodded and planted with a large number of young trees. Attractive flower beds in front of the office, as well as flower boxes on the window sills, add an atmosphere of beauty, while the substantial character of the buildings, bins and other appurtenances make the yard a credit to any neighborhood. Having thus gone to a great deal of trouble to make the whole site attractive, the firm are protecting this part of their investment and ensuring continued attractiveness by keeping one man wholly engaged in looking after the external appearance of the yard—watering and trimming the lawn and flowers, removing debris, cleaning the driveways and similar duties. There is no question that, quite aside from the sense of pride which a policy of this sort engenders, a certain amount of

result of the well-ordered and methodical nature of the yard. Who, if contemplating the purchase of building business with a firm [illegible] the run-down character of their yard and one with whom neatness and order predominated, would not choose the latter, all other things being equal?

Substantial Buildings and Equipment

The visitor to the yard is struck with the substantial character of the buildings and equipment. The office itself is a handsome one-storey structure of white stucco over interlocking tile, the basement being of cement block. Back of it is the cement shed,

An Industrial crane has proved its worth many times over in the expeditious handling of materials

in which are stored cement, hydrated lime and other neat products. It is a building of heavy timber framing, sheathed with corrugated iron and provided with numerous sliding doors. The floor is at the height of the average truck or wagon platform, thus facilitating the transfer of materials from warehouse to truck. A siding adjoins the back of the shed and permits direct unloading from the cars. To one side of the office is another corrugated iron building which serves as a garage. No extended accommodation is provided, however, for housing delivery equipment, since it is a policy of the firm to hire their transport service.

The yard itself is provided with sidings from the Canadian National Railways and the Toronto, Hamilton and Buffalo Railway (C.P.R.) Bulk supplies—sand, stone, etc.—are unloaded from the car either into stock piles or directly into bins by means of an "Industrial" locomotive crane, mounted on railway trucks, and which is used also for spotting and shunting cars. A stiff-leg derrick also assists in unloading cars. Four large-capacity steel bins, built by the Hamilton Bridge Works Co. Ltd., to Doolittle Russell's own specifications, provide, respectively, for 2 in. crushed stone, 1 in. crushed stone, ½ in. stone screenings and concrete sand. Each bin is fitted with two spouts, closed with counterweighted gates. Another excellent piece of equipment with which the yard is fitted is a "Batcher" plant for sand, made by the Blaw-Knox Co., Pittsburgh, Pa. This is a steel, one-compartment bin, which measures out accurately two one-cubic-yard batches. The yard is also equipped with a sand screener of special design.

The layout of the yard is such that the delivery trucks enter at the far end and, with no lost motion, pass all the bins in turn, finally being checked out at a weigh scale beside the office. In having to pass the office in this way, no outgoing load can leave without being checked by the office staff. While the yard is conveniently located to serve most of the city of Hamilton, it has been found economical to take care of orders from the west end of the city directly from Dundas, Ont., where the quarries of the Canada Crushed Stone Corp. are located, from which source of supply Doolittle Russell obtain their stone.

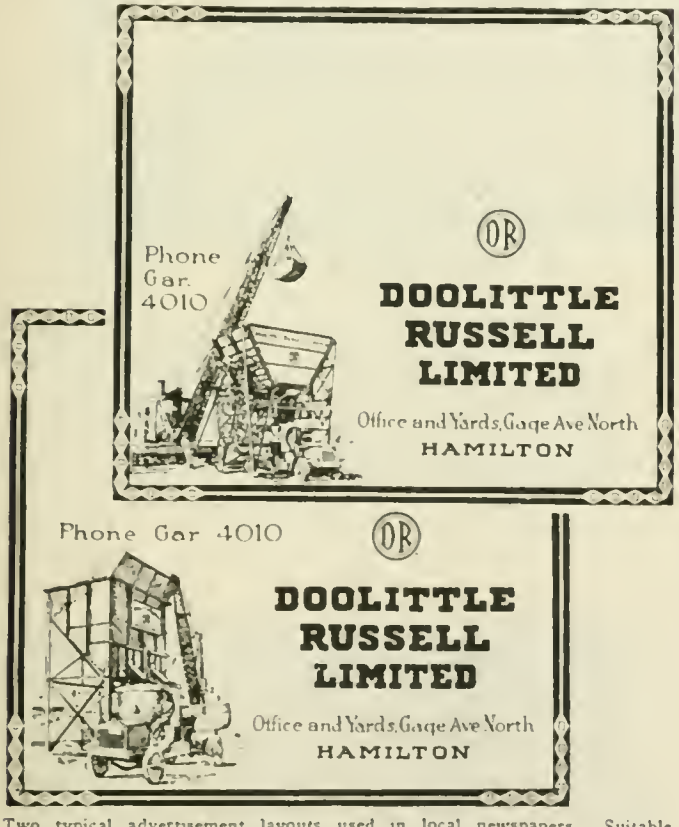
Delivery Performed Under Contract

As intimated previously, Doolittle Russell Ltd. do not possess their own delivery equipment, but hire trucks and teams under a contract, as many as 18 trucks a day being sometimes employed. The compensation is based on a rate per mile which varies according to districts and their distance from the yard. In contracting for their transport, instead of handling their own, Doolittle Russell Ltd. believe that they are solving their problem in the most econ-

When Doolittle Russell Ltd. promise delivery of crushed stone they have back of them the facilities of the Canada Crushed Stone Corporation, whose [illegible] plant is shown above. Direct delivery from this yard can be arranged for when it is desirable. In the background is the crushing and screening plant; the railroad siding at the right and storage system at the left. The foreground shows the auxiliary bin building

omical way, for the reason that, in their opinion, firms who make an exclusive specialty of haulage can operate much more efficiently than those with whom transport is just an incidental in connection with other business.

At the beginning of the article, reference was made to the wonderful growth of business which the Doolittle Russell firm has experienced. Evidence of this is provided by the fact that the company are now planning to enlarge their office quarters by the addition of another storey, the present accommodation having been absolutely outgrown. While the initial office staff was one stenographer in addition to Mr. McHaffie, the manager, it now numbers two office assistants and three bookkeepers. In fact, the accounting department has become so large that Mr. McHaffie had to give up his private office in order to provide the bookkeepers with adequate office space. The reason for this expansion in office staff will be understood when some figures are quoted. Up to the time of writing, which represents 7½ months of business, there had been shipped from the yard 826 cars of stone, 1,256 cars of sand, 108 cars of cement and 85 cars of other supplies. The average daily output is now 700 tons of materials, while a peak output of 1,000 tons has been attained. A big business is also being built up in McCracken concrete sewer pipe, manufactured by the Independent Concrete



Two typical advertisement layouts used in local newspapers. Suitable copy appears in the white space

Pipe Co., Woodstock, Ont., for which firm Doolittle Russell Ltd. have been appointed sales agents. Just recently the city council of Hamilton approved of the use of this pipe for civic work.

The Secret of Their Success

What, one may well ask, accounts for this stupendous development in so short a time? This, one of the editors of the Contract Record endeavored to learn by conversation with members of the Doolittle Russell staff and be believes he discovered the secret. To his mind, what is behind all the business is the close, intimate relationship which the firm develop to the job in hand and the strong, personal acquaintanceship which the staff enjoy with the foremen, superintendents and contractors at the city. The importance of that latter point was strongly emphasized by Mr. McHaffie himself. "The secret of

DOOLITTLE RUSSELL LIMITED
GENERAL SALES AGENTS
HAMILTON ONT

The letterhead employs the DR symbol, which the firm are seeking to popularize

our success," he said, "has been our thorough knowledge of and acquaintance with the men who are, or who may be, our customers. We endeavor to be on close terms with all the contractors and their purchasing agents and superintendents and with all the civic foremen. We familiarize them with our firm's name and the service which we can render. It pays immensely to be intimate with the people who may sometime be our clients.

Of course, while this personal contact may bring in business, it can never retain it unless there is some real service back of the relationship. This fact is fully recognized by Doolittle Russell Ltd. and for that reason they lay special stress on the need of keeping in immediate touch with every job for which they are supplying materials. They do not get the contract and let it go at that. They become, rather, part and parcel of the job, and through their acquaintance with the contractor and his staff, seek to co-operate in every possible manner, so that the utmost satisfaction and service will result. Take the Lister Building, Hamilton, as an example. This splendid seven storey, concrete office building, erected by the Pigott-Healy Construction Co., was constructed in remarkably rapid time, only 37½ working days being required, in fact, to pour the whole frame. For Doolittle Russell Ltd., however, the problem was more than just keeping the contractor furnished with enough materials to enable him to keep up his progress. It was complicated by the fact that, because of the location of the building, no storage space was available for a surplus of materials, with the result that enough supplies had to be laid in during the night to keep the job going the next day. This meant that Doolittle Russell Ltd. had to give a 24-hour service for seven weeks—a service they gladly rendered in order to satisfactorily meet the requirements of their client. The general contractors have expressed themselves as being indebted largely to this co-operation for the speed record they accomplished. That Doolittle Russell Ltd. were able to meet these exacting requirements was due to a considerable degree to the large capacity of their yard, the bins being capable of holding enough to give night service with the necessity of having only one man at work in the yard.

"We'll Keep Your Job Going"

The above incident is just typical of the service which the company tries to render consistently. "We'll keep your job going" is the Doolittle Russell slogan and it is to the credit of the firm that they make an earnest attempt to live up to the motto. As

Mr. McHaffie states: "The experience of the first few months in business has confirmed us in the policy of being prepared to supply everything the contractor needs promptly. To get business, however, we cannot sit behind our mahogany desks. We must get out and develop that personal touch that means so much in business relationship." Perhaps that is why Mr. McHaffie has already travelled in his car over 5000 miles around Hamilton, in the past 7½

Semet-Solvay coke plant, built by Semet-Solvay Co., of Syracuse, N.Y., as well as numerous smaller buildings and residences.

Developing a Cost System

The Doolittle Russell company are constantly seeking to improve their methods of conducting business and to this end, they are now engaged in developing a cost system which will give them an

Systematic yard arrangement ensures that no confusion takes place and that prompt delivery will result

months, just developing that personal touch that he speaks of.

The Doolittle Russell firm are strong believers in advertising as a means of creating business and goodwill and in the local newspapers, they are constantly spending a reasonable amount of money for publicity purposes. Another form of publicity which is being developed is the use of signs on the jobs handled by them. A characteristic feature of these signs is the use of the letters D R in a circle, as emblematic of Doolittle Russell service. This D R badge is being used in every possible place, including letterheads, etc., so as to get it firmly established in the minds of customers and prospective customers.

With regard to competition, Mr. McHaffie states that while there has been considerable of it, it has been fair and square and prices have not been cut in an effort to get business that could not be obtained by any other method.

Doolittle Russell Ltd. have been handling a large amount of sewer work during the past season and on this the same excellent service has been given as to all their contracts. The personal contact between the staff of the company and the civic officials has helped considerably in developing and maintaining this class of business. Private work has included, besides the Eaton building, the new East End subgarage, the Westinghouse factory, both constructed by the W. H. Yates Construction Co., and the

accurate knowledge of the cost of handling various commodities and provide a basis for estimating and tendering.

There is another matter which undoubtedly helps business of any kind and no less the building supply bhsiness, and that is, the development of the goodwill of the staff and employees. Doolittle Russell Ltd. have succeeded in obtaining this in no small measure, with the result that splendid harmony prevails between all the members of the organization and

An order of McCracken concrete sewer pipe received by Doolittle Russell Ltd.

each person on the staff is a strong booster for the firm and its principles. Just as an indication of the regard the company have for their employees, reference may be made to the establishment of a lunch room for the drivers in the basement of the office building, which is a service that the employees have appreciated very much.

From this resume of the activities of Doolittle Russell Ltd., it will be evident that, judging from results, they have found the right way of doing business. Other building supply dealers can well profit from their experience and many old-established firms can afford to follow the lead of this company, which,

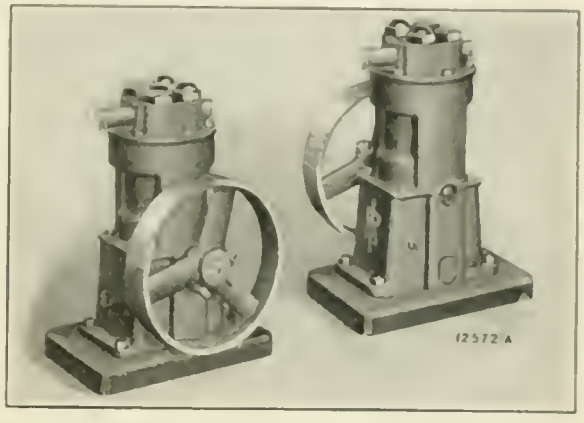
A "Barcherplant" is one of the special facilities of the Doolittle Russell yard

while young in point of years, have appreciated what builds up real success. Their achievements have been due in large part to the enthusiasm of the manager, Mr. McHaffie, and the co-operation of his staff. During the war, Mr. McHaffie was in charge of transport work in the British Army in Russia and has put to profitable use in the supply business, the experience gained in the army. Credit must be given also to the personal interest taken in the firm's activities by the president, Mr. Doolittle and by Mr. Leonard Wookey, manager of the John E. Russell Co., of Toronto. Both of these gentlemen gave up much of their time solving the difficult problems that arose during the first few months of the company's history. Through the efforts of all of those named, as well as the co-operation of staff, customers and the railways, the difficulties incident to a new company have been overcome and the firm go forward into 1924 with even greater vigor and ambition.

New Line of Vertical Belt-Driven Vacuum Pumps

A new line of small vertical belt-driven vacuum pumps has been brought out by the Canadian Ingersoll-Rand Co., Limited, 260 St. James Street, Montreal, Canada. This line of pumps known as type 15, will pull and maintain vacuums between 28.0 in. and 29.25 in. depending on their size. In addition to the standard belt design each size is built as a belt contained electric motor outfit, using the short belt drive arrangement or driven through pinion and internal gear. The vacuum pump and electric motor of both the short belt and gear driven units are mounted on a metal sub base, so that they are not dependent on the foundation for correct alignment.

The "constant-level" system of lubrication used on the type 15 vacuum pumps maintains a constant level of oil, which insures the right amount being



distributed to all parts. Like in the ordinary splash system, the bottom of the pump base forms an oil reservoir, of sufficient capacity, for the "constant-level" system. The amount of oil in this reservoir is determined by high and low level pet cocks. Above the reservoir and directly underneath the connecting rod is a constant level pan, into which the connecting rod dips and distributes just a sufficient quantity of oil for proper lubrication. The constant level pan is replenished with oil from the supply in the crank case by a valveless oil pump operated by an eccentric on the main shaft. Regardless of the amount of oil in the reservoir so long as it is somewhere between the high and low level pet cocks, it is stated this system will function perfectly.

There are six sizes—the 4 in. x 2 in.; 5 in. x 3 in.; 6 in. x 4 in. and 8 in. x 5 in. single acting pumps; and 10 in. x 5 in. and 12 in. x 6 in. double acting pumps. The 2 in., 3 in., 4 in. and 5 in. stroke single acting pumps are air cooled by means of an annular ring which encircles the cylinder, while the 5 in. and 6 in. stroke double acting pumps are cooled by means of circulating water. The type 15 vacuum pumps meet the requirements of chemical plants, food product factories, etc., where machines of smaller capacity than the regular straight line and duplex type are desired. Further details of these machines are given in a new bulletin, No. 3043 C, recently issued by the company.

Twenty-First Annual Meeting of Portland Cement Association

The twenty-first annual meeting of the Portland Cement Association was held at the Biltmore, New York on December 19 to 21 inclusive. As usual, the first day's program was devoted to meetings of standing committees covering such subjects as accident prevention and education, advertising and publicity, conservation technical problems etc., resulting in the presentation of annual reports which were presented at the business session on Wednesday, November 21. On Tuesday, also following several years' custom, the general session was devoted to a discussion of problems concerning mill practice or things related thereto.

The annual election of officers was held on Wednesday, November 21, with the following results: E. W. Kelley, Albany, N. Y., was elected president, Walter S. Smith, Chicago, first vice-president, and L. H. Baird, New York, second vice-president, all of the constituting re-elected officers. John W. Boardman, Detroit, was elected treasurer.

As most of our readers know, the Portland Cement Association has been carrying on for the past two years or more an educational advertising campaign, particularly directed toward acquainting the public with a better understanding of some of the problems of cement manufacture. As is too often true in connection with sizable industries, the common public loses sight of its inter-relation with, and interdependence upon any and all industry. It was the consensus of opinion, expressed at the meeting, that this campaign has produced most gratifying results and has justified a continuance.

Board-Foot Standard of Lumber Measurement

In the early days of lumber manufacture practically all lumber cut into boards or planks was sold on surface measure. A surface area of one square foot was considered one board foot, regardless of the thickness. Timbers, however, were sold on cubic measure. A need then arose to measure logs in terms of lumber measure. Thus it was necessary to adopt a standard thickness for the board foot, and gradually it became the practice to consider 1 inch as that standard for thickness. Lumber thicker than 1 inch was measured as the product of its surface area in square feet by the thickness in inches, while lumber thinner than 1 inch remained on surface measure. This board-foot unit was applied to lumber in the rough. Dressed lumber was always considered as of the same footage as the rough lumber used in its production.

Today very little yard lumber is sold in the rough, although the rough unit of measurement is used as the basis of computation and the rough or nominal size is used to designate individual items of lumber. Board-foot measurement is actual measurement when applied to rough green lumber only. In the same way, nominal sizes are actual only when applied to rough green lumber.

The board-foot standard is the most advantageous unit of measurement yet devised for use in computing lumber production and costs from the stump to its final use, in comparing prices of various products, and in compiling statistics of the lumber industry.—From "Standard Grading Specifications for Yard Lumber, as recommended by the U. S. Department of Agriculture."

Tenders for Watermains and Pipe in Edmonton

The following tenders were recently received by the city of Edmonton for watermains: R. A. Hulbert, 10013-83rd Ave., Edmonton, at $5,277.20 (accepted); C. L. De Wall at $5,159.60; Permanent Construction Co., at $8,011.80.

The following tenders were also received by the city of Edmonton for lead pipe: Mount Royal Metal Company, Montreal (accepted), $3,448.50; O'Hanlan Ferguson Co., Edmonton, $3,430.50; Revillon Wholesale, $3,011.98; Metals Ltd., Crane Ltd., James Robertson Co. of Winnipeg, Canada Metal Co. of Winnipeg, and Western Supplies, Eagle Smelting Co., Montreal, $3,762.00; Carrol Wilson, Ltd., $3,604.32.

New Power Plant at Tidewater, N.S.

The Nova Scotia Power Commission has recently signed a contract with the Albany Perforated Wrapping Paper Company of Albany, New York, to furnish that company at West River, Sheet Harbor, with 4600 h.p. of electric energy. The price for this power delivered at 2300 volts is about $21.30 per h.p. per year.

For the purpose of furnishing this power the commission will erect a second generating station on East River Sheet Harbor. This station will operate at a head of about 100' and will have an ultimate capacity of about 9000 h.p. It will be erected at Tidewater about four miles below the development at Malay Falls on the same river which the commission is just now completing.

Housing Shortage in the United States

A shortage of between 800,000 and 1,000,000 houses in the United States was revealed by officials of the National Housing Association, who gathered to attend the three-day session of the ninth national conference on housing in America held at Philadelphia recently. Three vital factors in the blockade on housing were summed up as follows: High cost of money; high cost of material; high cost af labor.

England to Build Wider Roads and Streets

County roads and city streets to be laid out in Great Britain will have a right of way 120 feet wide in most instances and 100 feet wide as a minimum, if present plans of the government are carried out. Because motor traffic has made it obvious that the old narrow country roads are not in these days safe, public enthusiasm in England has greeted the official plan for the widening of existing roads and the establishment of the 120 foot width as the official standard for the future.

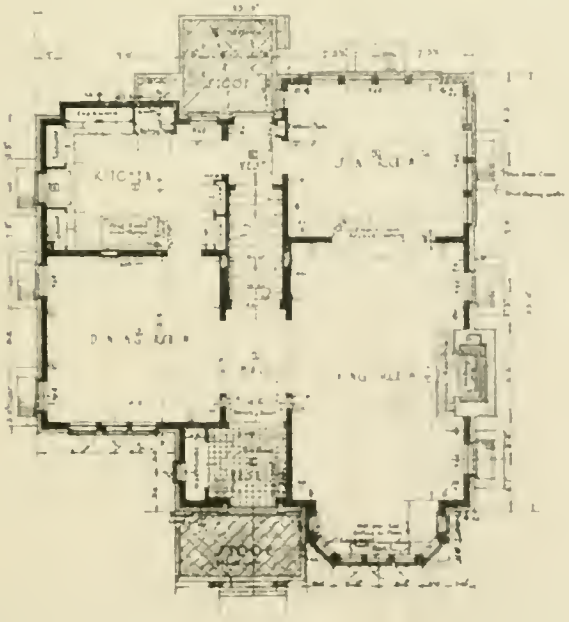
Long before the war the highways of England had become rivals of the railways through the use of motor trucks and steam traction engines, often hauling several trailers, each with a capacity of tons. The roads bore this traffic well and their splendid maintenance has enabled these highways to stand up under a much heavier traffic than 90 per cent of American roads receive.

The Contract Record's
Weekly House Suggestion No. 93

Distinctiveness of appearance is one of the principal features of this residence, designed by Mr. G. J. P. Jacques, architect, 3 Ouellette Ave., Windsor. Brick is effectively used in the base and trim of the handsome front entrance and on window trim, cornice, chimney, etc. Roofing is of wooden shingles, stained.

The centre hall plan of the first floor provides a beautiful large living room on the right, equipped with handsome hearth and connecting with sunroom at the rear through a wide arched doorway, fitted with French doors. The dining room and kitchen to the left are both large rooms and the latter, as seen on plan, is equipped with many built-in service features. The plan reproduced requires very little explanation, it is so complete in descriptive detail. All the rooms are provided with plenty of natural light through many well placed window openings.

Upstairs there are three bedrooms, all bright, good-sized rooms with wardrobe and closet space incorporated in each room. The flooring and trim throughout is of hardwood, with the exception of the bath room, which is finished in tile.



How Should Lime Plaster be Applied?

(Continued from page 1213)

48. For finish coat specification, see section 19.

Finish Coat Specifications

49. (a) The white coat shall be applied evenly and trowelled to a hard and smooth finish. The finished surface shall be true to plane and free from all brush marks or other imperfections.

(b) The sand finish shall be applied in a thin even coat and trowelled, worked or rubbed to the desired even finish and texture. The finished surface shall be true to plane and free from all brush marks or other imperfections.

Proportions for Finish Coats on Lime Plaster

Hard White Coat	White Sand Finish
Stiff lime putty	Stiff lime putty
Plaster of paris	White sand
3 parts by volume	Plaster of paris
1 part by volume	3 parts by volume
	3 parts by volume
	1 part by volume

Brown Sand Finish

Stiff lime putty
Brown sand
Plaster of paris or
Portland cement
1 part by volume
3 to 4 parts by volume
As required (about 20%)

White Skim Coat

Lime putty only

50. Where quicklime is used for finishing it shall be thoroughly slaked in a watertight box and run through a No. 10 sieve (10 meshes per inch) and allowed to stand until cool before applying.

51. Where finishing hydrated lime is used it shall be made into a putty and allowed to stand over night before using.

Mainly Constructional

East and West—From Coast to Coast

Mr. J. W. McConnell, vice-president of the Dwight P. Robinson Co., of New York, addressed the Montreal Branch of the Engineering Institute of Canada at a recent meeting, the subject of his address being the irrigation work carried out by his company in northeastern Brazil. Mr McConnell's address was illustrated by a number of lantern slides.

At the recent civic elections at London, Ont., the city hall scheme was defeated by a vote of 4,566 against 2,834, and the Specialized Fire by-law was also defeated by a large majority.

Construction of the new grain-carrying jetty near No. 1 Shed, and the reconstruction of the pier at Vancouver harbor, will be commenced at once, contracts for the work having been awarded recently. The dredging contract goes to the Vancouver Dredging Company and the substructure of the pier will be built by the Pacific Construction Company. The latter's tender was about $600,000.

At the recent meeting of the township council, York township, Ont., recently, a by-law was passed authorizing the signing of a financial agreement with the Toronto Transportation Commission for the extension in the township of the Yonge St. car line. The agreement provides for a total cost of $1,250,000. The street car line will be extended under this agreement from St. Clair Ave., up Oakwood Ave. to Rogers Rd., through Prospect Cemetery, and will connect ultimately with Davenport Rd.

The contract for the construction of two new bridges over the St. Charles River at Quebec were awarded a few days ago by the council of the municipality of Quebec West to T. E. Rousseau of this city. The bridges will be erected at a cost of $160,000. The bridges in question will be built, one on the site of the old Scott Bridge and the other on Marie Incarnation St.

By a majority of 179, municipal electors in the town of Pembroke, Ont., voted recently in favor of a money by-law to raise by way of loan the sum of $75,000 for the purpose of constructing a bridge over the Muskrat River at Mary St.

The province will contribute 40 per cent, or $17,600, towards the new bridge across the Speed River on King St., Preston, Ont., on which work is now under way. The Grand River Railway also bears part of the cost, as its tracks will be on the bridge.

A program of road building in British Columbia, which will involve the expenditure of about $20,000,000 during the next five years, was outlined in the legislature recently by Hon. W. H. Sutherland, minister of public works. Trunk roads will be extended and improved, and a network of lateral settlement roads will be built as feeders.

Toronto is to have another $100,000 theatre, at the corner of Woodbine and Danforth Avenues. Work has been already commenced and the theatre when completed will have a seating capacity of 1,200.

The city of Toronto is considering the erection of a permanent cenotaph on the city hall lawn, at an estimated cost of $25,000.

Considerable progress is reported on the revetment wall which the United Grain Growers' Limited is building on the lake front at its large elevator site at Current River, Port Arthur. Work is also to be started shortly on the elevator dock, which will extend for a distance of 550 feet along the newly dredged slip. This work is all preparatory to a commencement on the erection of consolidated terminal elevator facilities at Current River, which, when completed, will have a capacity of 7,000,000 bushels. Provided satisfactory arrangements can be made, it is understood that this work will be started next spring.

Contract for the construction of a new pumping station at Fort Erie, Ont., has been awarded to Messrs Fry & Co., of Toronto, at a figure of $18,596.

The Gay Company, of Oshawa, Ont., have secured the contract for the erection of an addition to the high school there at a figure of $194,450.

Trade Incorporations

Osborne Craft Homes Corporation, Ltd., with head office at Toronto, capital $40,000, to carry on the business of contractors and builders.

Obituary

Sir William MacKenzie died at his home at Toronto recently. Death was due to heart trouble.

Right Hon. Baron Shaughnessy, chairman of the Board of Directors of the Canadian Pacific Railway, died a few days ago at his residence in Montreal, after a very brief illness.

Mr. Thos. Neil Doody, Assistant Minister of Public Works, Ottawa, died a few days ago at San Raphael, Cal., where he had gone but recently to recover his health. Mr. Doody was born in Montreal in 1856 and entered the Canadian civil service in 1886.

CONSTRUCTIONAL ACTIVITY

Period of December 12 to December 18, 1923

Dominion Wide Service Exclusive to "Contract Record & Engineering Review"

Waterworks, Sewerage and Roadways

Digby, N. S.
The ratepayers of Digby recently passed a By-law for the purchase of an oil engine in connection with waterworks system. Town council is now in market for a 74 h.p. or 100 h.p. oil engine 1,000 gal. tank is to be purchased at once.

Ford, Ont.
Tenders are being received till December 27 by Essex Border Utilities Commission, Windsor, Ont., through the secretary, R. B. Baird, for the following contracts in connection with $250,000 filtration plant to be built (a) construction of reinforced concrete filters etc; (b) supplying 42 in. dia. steel pipe; (c) supplying cast iron pipe and specials; (d) supplying valves and sluice gates; (e) supplying rate controllers and operating tables. Engineer, J. Clark Keith, Essex, Ont; consulting engineers, Gore, Nasmith & Storrie, Toronto. Plans and specifications with engineers. Marked cheque for 5% of tender required.

Guelph, Ont.
Work is in progress for the laying of sewers in several streets here

Hamilton, Ont.
The city council contemplates laying asphalt pavement to cost $12,000, Kenilworth Ave. from Main St to Barton St.

Work is to start shortly for the laying of cement sidewalk to cost $1,778, Kenilworth Ave. from Roxborough St., to Main St. west side. Engineer is W. L. McFaul.

Port Perry, Ont.
The town council contemplate laying 1 mile of bituminous bound macadam road, to cost $25,000. J. D. Kean, Whitby, Ont., is the engineer. Work to start in spring under supervision of road superintendent.

CONTRACTS AWARDED

North Bay, Ont.
Warren Bituminous Paving Co. of Ontario, Ltd., 51 University Ave., Toronto, has been awarded the general contract for pavements at $193,729. General contractor does all work. Underground work to start Jan. 2nd; paving to start May 1st.

Railroads, Bridges and Wharves

Railroads Bridges and Wharves

Canning, N. S.
Dominion Atlantic Rly., Kentville, N. S., contemplate the erection of a railway station here. This work will not go ahead before spring.

Ste. Germain Lac Etchemin, Que.
Tenders for the erection of an iron bridge here are being received till January 1st by the town council, through the secretary, J. I. E. Chabot, Ste. Germain du Lac Etchemin, Que. Plans and specifications with Ivan E. Vallee, engineer, Parliament Bldgs., Quebec Que., and the secretary.

Tadoussac, Que.
Tenders are being received till January 8 by the Dept. of Public Works, through the secretary, L. H. Colman, Parliament Buildings, Ottawa, Ont., for extension to headblock of wharf. Plans and specifications at department offices or district engineers, Post Office Building, Quebec, Que., Shaughnessy Bldg., Montreal, Lower St. Lawrence Power Building, Rimouski, Que., and at post office, Tadoussac, Que. 10% accepted cheque required.

CONTRACTS AWARDED

Cannes de Roches, Que.
Arthur Nadeau, Chardler, Que., has been awarded the general contract for breakwater extension at $5,169.

Niagara Falls, Ont.
General contract for 2 concrete arch bridges, $21,000, in Queen Victoria Park, has been awarded to R. H. H. Blackwell, Hamilton Trust building, Toronto.

Public Buildings, Churches and Schools

Acton, Ont.
The erection of a new library is contemplated by the Library Board. Estimates to be obtained for new building.

Ansonville, Ont.
Work is in progress on $10,000 town and fire hall. T. A. Massicotte, Ansonville, is supervisor of work.

Athens, Ont.
Tenders are being received till January 10, by Athens High School Board, through the secretary, Geo. E. Holmes, for $70,000 high school to be built here. Plans and specifications with architect, A. Stuart Allaster, King St., Brockville, Ont., and MacLean Building Reports, 345 Adelaide W., Toronto.

Cabano, Que.
Trimming interior is in progress on $100,000 church being built here for R. C. Parish. Architect, E. P. Raymond, 70 LaLiberte, Quebec, Que. General contractor, Geo. Dube, Cabano, Que. Heating trade to be let.

Edmonton, Alta.
Tenders for the construction of foundation for grain elevator will be received till December 28 by the Dept. of Trade & Commerce, Ottawa, Ont. through the deputy minister, J. C. O'Hara. Plans and specifications with C. D. Howe Co., consulting engineers, Port Arthur, Ont., and Edmonton, Alta.

Halifax, N. S.
The [illegible] council contemplate an addition to city home on South St. Estimate of the work [illegible] be submitted to ratepayers on January 1.

Montreal, Que.
J. B. De Pateville, architect, 61 Fourth Ave., Ville, has prepared plans for $100,000 college to be built near Mile End Road, for Italian Association. Tenders will be called by architect in March 1924. Plans and specifications with architect.

Jos. Sawyer, 407 Guy Street, is preparing plans for completion of church on Amherst St., near Robin, owned by St. Catherines Parish. Tenders for this work will shortly be called.

Mimico, Ont.
Burke & Gormlick, 101 King W., Toronto, are preparing plans of $100,000 high school to be built here.

St. John, N. B.
F. Neil Brodie, 19 Princess St., is preparing plans for $75,000 addition to school on St. James St., owned by R. C. Church.

St. Joseph, Que.
S. Rene Richer, 240 Girouard St., St. Hyacinthe, is preparing plans of school to be erected here, owned by R. C. School Board. Tenders for this work will be called early in February.

Sault Ste. Marie, Ont.
Plummer Memorial Hospital contemplate an addition to hospital to cost $75,000. Work is expected to go ahead in spring.

Toronto, Ont.
Bulk or separate tenders are being received till December 28 by the architect, E. J. Lennox, 261 Bay St., Toronto, in connection with alterations and addition to hospital buildings (maternity department) of Western Hospital. Plans and specifications with architect.

H. N. Dancy & Son, 22 College St., are submitting a tender in connection with addition to Toronto General Hospital, and want prices at once on sub trades except masonry.

West St. John, N. B.
F. Neil Brodie, 42 Princess St., St. John, N. B., is preparing sketch plans of $100,000 church contemplated by the R. C. Parish.

Weedon, Que.
Tenders to [illegible] December 22, by the architect, J. W. Gregoire, 16 Wellington St., Sherbrooke, Que., on all trades, except heating, including extras, in connection with [illegible] church and rectory to be [illegible].

CONTRACTS AWARDED

Brockville, Ont.
Wm. Lamont, Dominion Rd., has the

[illegible] with [illegible] Steel and Chrysler Building, All trades [illegible]

Cobalt, Ont.

[illegible] Engineering Co. Ltd. [illegible] Cobalt Reduction Co. [illegible] Ltd. to W. A. Hodgson, 20 Dundas St. Toronto [illegible] Peffley & [illegible] architects. Walker & Gow [illegible]

Grite Bay, Ont.

Work is [illegible] $10,000 [illegible] J. M. Nichol [illegible] has the contract [illegible] Ed Chaney general contractor, 139 Spring St. Sault Ste. Marie, Ont. wants prices [illegible]

Hamilton, Ont.

A. S. Kemmis is [illegible] has the contract for electrical work, and Sons, Ltd., 7 Main St. W. the plumbing and heating contract of school being built on Murray St. W. General contract [illegible] Hyde Bldg. [illegible] Wetmore & Walsh

Haileybury, Ont.

[illegible] Gibson has the contract for [illegible] and heating of $15,000 rectory being built here for St. Pauls Parish church. Balance of work by general contractor, Jos. Isherwood, Haileybury.

Montreal, Que.

Heath Ross Co., Ltd., 10 Cathcart St., have been awarded the general contract for $500,000 hospital to be built on Pine Ave. and are receiving tenders on sub-trades. Montreal Unit Shriners are the owners. Associate architects, Hugh [illegible] 118 Pleury St., and J. M. Miller, 204 Dorchester St. W.

[illegible] Ballantyne 185 Nazareth St., has the contract for plumbing, heating and ventilation of city hall being built on Notre Dame St. Electric to be let. Architects, Lorie Pepent, city hall.

Ottawa, Ont.

P. Lyall & Sons Construction Co., Ltd., Montreal, have been awarded the contract for addition to archives building at $94,797. Architect, R. C. Wright Dominion Chambers, O'Connor St., Ottawa.

Oshawa, Ont.

[illegible] Ltd., Oshawa, have been awarded the general contract for addition to Technical Institute at $161,150. Tenders for mechanical trades will be called about January 1, 1924. Architects, Hutton & Souter, Bank of Hamilton Bldg., Hamilton.

St. Lambert, Que.

[illegible] Bridge Co., Ltd., Lachine, Que., has the contract for structural steel for [illegible] Lighting Co. erected here for [illegible] electrical dept. H. Arnaud, 124 St. Denis St., is the general contractor. Engineer in charge is J. [illegible]

Business Buildings and Industrial Plants

Acton, Ont.

[illegible] Co. is having [illegible] prepared for [illegible] addition to their factory here.

Alfred, Ont.

Peat Fuels, Ltd., 230 Dorchester St. W., Montreal, contemplate rebuilding peat bog plant here. Will shortly be in the market for machinery and equipment.

Cartierville, Que.

Tenders are being received till January 2nd by the president, Mr. O'Connor, Cartier Jockey Club, 152 St. James St., Montreal, in connection with $76,000 grand stand and stables to be erected. Architect, A. Shearer, 1225 St. Patrick St. 10% guarantee bond required.

Eastview, Ont.

V. Sabourin, contemplates building a mineral water plant here.

Hamilton, Ont.

Dominion Sand & Gravel Ltd., Westdale, contemplate building a plant here.

Work is to start shortly on new plant to cost $150,000, owned by the J. P. Porter Co., for the manufacture of patent fuel out of anthracite screenings, etc.

Kitchener, Ont.

Work is to start shortly on $45,000 addition to warehouse owned by M. B. Shantz. General contractors, Reitzel Bros., Waterloo, Ont. Architects, Schmalz & Jones. Plastering and masonry, day-work under general contractors.

Lachine, Que.

Frank Peden, 65 McGill College Ave., is preparing plans of club house to be erected at Lachine Lake for Mount Island Golf Club, Inc.

London, Ont.

E. W. Moore, 30 Victor St., is having plans prepared for $20,000 store to be built on King St. Work not likely to start before spring.

Langley Fort, B. C.

North Langley Co-Operative Assn., is having plans prepared for a $5,000 feed warehouse. Work day labor by owners.

Montreal, Que.

P. J. Turner, 274 Beaver Hall Hill, is preparing plans of office building to be erected on St. James St., owned by Crown Trust Co.

Excavation work is in progress for 6 stores, theatre, bowling alley dance hall and meeting hall, total cost $250,000, on east side Park Ave. near Bernard Leger & Lamoreux, St. Denis building, are the general contractors and want prices on 6,000 ft. form lumber, stone, sand and reinforced steel, also wish to rent steam hoist. Decorative plastering and art fenture front) to be let by general contractor. No materials purchased. Architect, R. Gariepy, 15 St. James St.

Quebec, Que.

Foundations are in for $30,000 store and office at 348 St. Paul St., owned by La Cie. D'Immeubles St. Paul Enrg. Work by day labor.

Sheet Harbor, N. S.

Whitby Perforated Wrapping Paper Co. contemplate alterations to their pulp mill here, estimated to cost $250,000 and are in the market for main electric motor, 1000 h.p., 60 cycle, and 2 or 3 secondary motors each 2,000 h.p. This work will start in May, 1924, day labor by owners.

St. Bruno, Que.

K. G. Rea, 285 Beaver Hall Hill, Montreal, is preparing plans of $75,000 club house for Mount Bruno Country Club. Tenders for this work will be called in the spring.

Senneterre, Que.

Bell River Pulp Co., Ltd., are having plans prepared for a pulp mill to be erected 56 miles east of Amos, Que. This work will go ahead during 1924.

Toronto, Ont.

Nasmiths Ltd., 42 Duchess St., contemplate an addition to their plant. Nothing definitely decided upon.

Foundations are going in for $100,000 theatre north east corner Woodbine and Danforth Aves., for Danforth-Woodbine Theatre Ltd. Architect, J. Hunt Stanford & Son, 67 Yonge Arcade. Carpentry by day labor. Roofing, plumbing, heating, electric, plastering and painting to be let.

Alterations to building for offices, at 17 and 19 Adelaide West, is contemplated by the owners, Jenkins & Hardy, 151½ Toronto St. Not definitely decided what will be done, or when.

Work is to start shortly on alterations and addition to stables on south side Pears Ave., costing $25,000, owned by Canada Bread Co., Ltd. Architect, W. R. Bird, 6 King W., general contractors, Fred Holmes & Sons, Ltd. Sub-Contracts have not yet been let.

CONTRACTS AWARDED

Bathurst, N. S.

Geo. Eddy Co., Ltd., have the general contract for $8,000 drug store and office being built on King St. for J. H. Meahan. Tenders are being received till December 31 by general contractor for plastering, painting, electric, heating and plumbing.

Dixie, Que.

Foundations are in for $48,000 club house for Summerlea Golf Club, Montreal. Millwork—Wm. Rutherford & Sons Co., Ltd., architect, C. R. Tetley, 314 Beaver Hall Hill, Montreal; general contractor, J. H. Salisbury 257, Walkley, Montreal.

Ford City, Ont.

The following sub-trades have been let on heat treat building owned by Ford Motor Company; steel sash—Canadian Metal Window & Steel Products Ltd., Toronto, roofing—A. W. Carmichael, Ltd., Walkerville, and Federal Cement & Tile Co., Chicago; plastering—Crawford & McGaw; glazing—C. M. Bennett, Walkerville; terrazzo—Italian Mosiac & Marble Co., Ltd., London; miscellaneous iron—T. J. Eansor & Sons, Windsor; electric wiring for operating steel doors—Beattie-McIntyre, Ltd., Toronto. Architects, Albert Kahan, Ltd.; general contractors—Wells & Gray, Ltd., Ford, Ont.

Grande Ligne, Que.

The following sub-trades have been let on $80,000 gymnasium and workshop being erected for Feller Institute; millwork—Wm. Rutherford & Son; electric—H. E. Cassidy, 255 Regent; ornamental iron—E. V. McKay Iron Works. Bremner Norris & Co., Ltd., Montreal, are the general contractors. Architect, S. Comber, 127 Stanley St., Montreal.

Hamilton, Ont.

Hamilton Bridge Works Co. is supply-

ing the structural steel for foundry building to be built on Aberdeen West for Canadian Westinghouse Co. Tenders for balance of work are being received by the architect, B. H. Prack, Main East, Hamilton, and 50 Bay St., Toronto.

J. & G. Inrig, 206 Locke St. S. have the contract for sheet metal and ventilating, and Otis-Fensom Elevator Co., Ltd., the elevators, in connection with the Laster building being erected on James St. N. General contractors, Pigott Healy Construction Co., architect, B. H. Prack, Bay St., Toronto.

Longue Pointe, Que.

H. C. Johnston Ltd., 260 St. James St., has the general contract for $8,000 extension to foundry of Canadian Steel Foundries, roofing—Geo. W. Reed & Co., Ltd.; plumbing—W. G. Bailey, 145 Bleury St.

Montreal, Que.

The following sub-trades have been let on $15,000 warehouse being built here for Sherwin-Williams Co.; structural steel—Dominion Bridge Co., Ltd., Lachine, Que.; roofing—Campbell Gilday Co., Ltd.; plumbing—W. G. Evans, 4 Park Ave., electric to be let. Anglin Norcross Ltd., are the general contractors; architect—T. Pringle & Sons Ltd.

Work has started on repairs to bakery, costing $15,000, owned by Canada Bread Co., 611 Rivard St. Bremner Norris Co. have the general contract; structural steel—Phoenix Bridge & Iron Works, Ltd.; roofing— Geo. W. Reed & Co. Sheet metal, electric, plumbing and heating to be let.

Work is in progress for repairs to warehouse at 84 St. Peter St., costing $14,000. General contractors—Cook & Letch, 258 Beaver Hall Hill; heating and plumbing—Selkirk Bros; elevator—Otis Fensom Elevator Co., Ltd.

Ottawa, Ont.

Geo. Graves Construction Co., Jackson building, have the general contract for $10,000 store being built on Bank St. G. Green, Bank and Fourth Ave., is the owner.

Sault Ste. Marie, Ont.

The following sub-trades have been let on $6,000 store block being built on Queen St., owned by Flockhart Bros., 421 Queen East; electric—K. L. Keith, 179 March St.; plumbing—S. F. Adland, 363 Queen E.; plastering—W. Wray, 332 Albert St. E.; painting—Wm. Hallam, 355 Queen E.; roofing by owner. Architect, T. Wilks, 612 Queen St.

Toronto, Ont.

Foundation work is to start shortly for addition to offices at 1301 Bloor West. Geo. Thompson, 823 Shaw St., has been awarded the general contract. Owner is Norman Baird, 1301 Bloor West.

Waterloo, Ont.

Foundations are going in for $9,000 warehouse on King St., owned by O'Donnell & Henderson. General contractors, Eller Bros; heating contract has been let to O. Gross, Waterloo.

Windsor, Ont.

Foundations are going in for 2 stores and 2 flats, on Sheppherd St. Plumbing and heating contract has been let to A. D. Belair, Park and Dougall Ave. Electric and plastering to be let. Owner and general contractor is J. E. St. Onge, 1052 London St. W.

Winnipeg, Man.

J. H. G. Russell, 1110 McArthur Bldg., is preparing plans of alterations to office building at 63 Albert St., owned by F. W. Hammond, 63 Albert St. General contractor—W. A. Irish, 15 Kennedy Bldg.

Residences

Hamilton, Ont.

Chas. Salmon, 97 Ottawa St. S., is the owner and general contractor of $7,500 residence being built on Dalhousie St. Sub-trades to be let.

Kitchener, Ont.

A. Helm, 27 Shanley St., is owner and general contractor of $5,000 residence to be built on Shanley St. Plumbing, heating, electric and painting to be let.

A. H. Schweitzer, is owner and general contractor of $5,000 residence to be built on Strange St. Carpentry, plumbing, heating, plastering and painting to be let.

Mount Royal, Que.

F. G. Robb, 127 Stanley St., is preparing plans for $16,000 residence to be built near Montreal, for Wm. Wray, 617 University. Tenders will shortly be called by the architect.

Montreal, Que.

J. Cratton, 3138 St. Urbain, contemplates building a $10,000 residence on Laverdure, south of Gouin Blvd. Work to go ahead early in spring.

D. Belanger, 2052 Chateaubriand, is owner and builder of $8,000 residence on Chateaubrand, near Belanger. Masonry, millwork, roofing, electric, plumbing, plastering and painting to be let.

Foundations are in for $10,000 residence on Clarke, near Blvd. Gouin. Owner and builder is N. Paiement, 2795 St. Lawrence Blvd. Brickwork, roofing, electric, plumbing, heating, plastering, painting and glazing to be let.

C. Brochu, 547 Cuvillier St., contemplates building 15 flats corner Aylwin and Cuvillier Sts.; also stone and flats, $10,000 corner Rouen and Davidson Sts., Sub-trades to be let. Work will start early in spring.

J. A. Drouin, 1318 Iberville St., is owner and builder of $8,000 residence on Chapleau St., near Marie Ann. No materials purchased.

Plans have been drawn for $100,000 apartment house. S. Marotta, 195 Ste. Catherine E., is owner and builder. Work will likely go ahead this year or early next year.

Work is to start shortly on $10,000 residence on Henri Julien, between Villeray and Jules Verne. H. Papineau, 3276 Drolet St., is owner and general contractor. Electric, masonry, millwork, plastering and plumbing to be let. Roofing and painting by owner.

Outremont, Que.

Work is to start shortly for 2 flats, $14,000, to be built on Laviolette Ave. H. Bourbonnais, 690 Delormier is the owner.

Ottawa, Ont.

C. H. Stata, 209 Pretoria Ave., is owner and general contractor of $6,000 residence on Grove Ave.

Port Stanley, Ont.

Richard Mathews, [illegible] residence on Prospect St.

Stratford, Ont.

[illegible] plate [illegible] Yonge St.

St. Thomas, Ont.

Foundations are in for [illegible] $10,000, on Talbot St. Owner is A. E. Thomas, 221 Talbot St.

Toronto, Ont.

Foundations are going in for $8,000 residence south side Garfield Ave. near Sighthill Ave. Harry Jerkins, 341 St. Clair Ave., is the owner and general contractor, who supervises all work and will let plastering, heating, electric, plumbing and painting. Carpentry and masonry by day labor.

Foundations are going in for $8,000 residence at 141 Glenrose Ave. F. N. Alexander, 151 Bedford Park Ave., is the owner and builder who will let heating, electric, plumbing, plastering and painting. Carpentry and masonry by day labor.

Foundations are in for 1 pair and 1 single residence, $12,000, east side Wedfield Ave., near Gerrard Rd. Owner and builder—Forton & Driffield, 72 Hiawatha. Masonry day labor. Electric, plumbing, heating, plastering, and painting to be let.

Work is to start shortly on 2 pair residences, $7,000 a pair, west side Ashdale Ave., near Gerrard E. Owner and builder is S. F. Lankin, 667 Pape Ave. Heating, painting, electric, plastering and plumbing to be let. Masonry by day labor.

H. E. Warrington, 222 Woodbine Ave., contemplates building 1 pair residences, $7,000, east side Rhodes, near Hanson Ave. Painting, plastering, electric, plumbing and heating to be let. Masonry day labor.

Work is to start shortly for 1 pair residences, $7,000, east side Elmer, near Rhyl Ave. Owner is Mrs. H. Mattacott, 5 Manghan Crescent. Painting, plastering, electric, plumbing and heating to be let.

Foundations are in for $7,000 residence south side Garfield Ave., near Welland. H. Jenkins, 341 St. Clair Ave. E., is owner and builder, who will let heating, painting, electric, plastering and plumbing.

W. Carter, 540 Dovercourt Rd., is owner and builder of $7,500 residence south side Raymond Ave., near Brummell Ave. Tenders are being received on heating, painting, electric, plastering and plumbing.

Walls are going in for 1 pair residences, $7,500, south side Strathmore Blvd., near Coxwell Ave. Owners and builders, Jackson & Mitchell, 554 Logan Ave. Masonry by [illegible]. Plastering, painting, electric [illegible] and plumbing to be let.

Foundations are going in for $10,000 residence south side Hoodstead Ave., near Glen Rd. F. H. Wallis, care architects, Wallis & Wallis, 18 Scott St. Carpentry and masonry by general con-

Continued on page 49

Tenders and Proposals

Official Notices by Governments, Municipalities, Architects and Engineers

TENDERS

Friday, January 4th, 1924,

Wednesday, January 9, 1924,

POSITION WANTED BY STEAM ENGI

RATES

20 cents per agate line (14 lines to the inch) Position Wanted 1 cent per word per insertion. Positions Vacant 2 cents per word per insertion. Box number 10 cents extra. Advertisements for this Section must be received not later than noon on Tuesday to ensure insertion in Wednesday issue.

ESSEX BORDER UTILITIES COMMISSION

Tenders for Water Purification Plant

Sealed tenders addressed to the Secretary of the Commission will be received by the Essex Border Utilities Commission, Heintzman Building, Windsor, Ontario, up to 4 p.m. on

Thursday, December 27, 1923,

for the following contracts connected with the construction of a water purification plant in Ford City, Ontario.

(a) Construction of reinforced concrete Filters, coagulating basins, pure water reservoir, office building, etc.
(b) Supplying 42" diameter steel pipe.
(c) Supplying cast iron pipe and specials.
(d) Supplying valves and sluice gates.
(e) Supplying Rate Controllors and operating tables.

Plans and specifications can be obtained and further information secured from J. Clark Keith, Chief Engineer of the Commission, Windsor, Ontario, or from Gore, Nasmith & Storrie, Consulting Engineers, 625 Confederation Life Bldg., Toronto, Ontario.

A cheque for $1000 must be submitted before plans and specifications can be obtained for the construction contract (a) which will be returned on tenders being submitted.

A marked deposit cheque for 5% of the tender sum must accompany all tenders.

These tenders will be opened at a public meeting to be held in the office of the Commission at 4 p.m., Thursday, December 27th, 1923

The Commission reserves the right to accept any or reject all tenders

R. B. BRAID,
Secretary

5951

Too little attention is given, according to Mr. H. F. Kleinfeldt, to the proper size of pebbles for the grinding of a certain kind of material to a given fineness. If the grinding consists in the reduction of a fairly coarse material, say, about ¼ in. to ½ in., and it is not necessary to grind the finished product very fine a large pebble or ball should be employed. If the feed consists of a mixture of coarse and fine material it is advisable to take a mixture of small and large pebbles or balls. If the material is fed in a fairly fine condition, say, 10 per cent to 20 per cent. mesh, and the resulting product is to be extremely fine, it is advisable to use small pebbles or balls. In other words, the idea in fine grinding is to have as many points of contact as possible with a pebble or ball of sufficient weight, so that the impact is sufficient to reduce the material to be ground. It can be readily seen from this that the ideal condition is obtained with maximum points of contact and with pebbles or balls of sufficient weight to grind or pulverize the material. This is true in either wet or dry grinding. In the case of dry grinding, the moisture content of the material to be ground is very important and it has been definitely established that greater efficiency is obtained when the material is as free from moisture as possible.

According to some elaborate tests carried out by the American Society of Testing on the painting of iron and steel, the following points have been developed:—(1) The thorough methods of preparation, i.e., sand blasting and picking, show no superiority over ordinary methods of removing loose scale, rust and dirt by scraping, brushing and wiping. This applies to both new steel and old steel which has been in service. (2) Weathering to permit loosening and partial removing of mill scale before painting is inimical to preservation. (3) Painting in a cold dry atmosphere gives results as good as in warm dry atmosphere, or on heated steel. (This may be due to the greater thickness of coatings applied in the cold atmosphere.) (4) The preparation of old painted steel surfaces, which have bare rusted spots, by brush coating with benzine over and around the rust spots, burning the benzine off and then scraping and wire brushing, gives better results than scraping and wire brushing without the benzine treatment and better results than sand blasting. (5) There is no difference observable in the results of the application of the same methods to old and to new steel.

In view of the progress in recent years in the design and construction of hydraulic turbines, with their sensative automatic control devices and the nicety of balance that is now attained, it is a decided shock, says the Engineering News-Record, to hear of a large unit being actually installed with something so far wrong in design as to prevent successful operation. A 10,000 horse-power water wheel, on being put in service, vibrated so seriously that the power company shut it down, but finally the trouble was corrected, or at least reduced it to safe limits, by the comparatively rough method of decreasing the runner diameter 5 in. by cutting off metal around its entire circumference with an oxy-acetylene blow-pipe.

Residences

(Continued from page 47)

tractors, W. W. Petley & Co. who will let other mechanical trades.

I. Mummigs, 160 Hillary Ave., is owner and builder of 4 residences, $10,000, west side Watt Ave., near Kersdale Ave. Painting, plastering, electric, plumbing and heating to be let. Masonry day labor.

J. V. Houden, 236 Humberside Ave., is owner and builder of $8,500 residence and garage, south side Baby Point Rd., near Thornhill Ave. Plastering, painting, electric, heating and plumbing to be let.

Excavation work is in progress for block of stores and apartments south west corner St. Clair Ave. and Northcliffe Blvd., owned by Ralph Building Construction Co. Tenders on all trades are being received by the architect, B. Swartz, 336 Dundas West.

Work is to start shortly for 1 pair residences, $7,500, at 16-18 Normandy Blvd., owned by Hewitt & Roberts, 641 Glebeholme Ave. Masonry by day labor. Plastering, painting, electric, heating and plumbing to be let.

Foundations are going in for 2 pair residences, $7,500 a pair, east side Cannon Ave. near Gerrard East. Alex. Hussy, 54 Ravina Crescent is the owner and builder. Masonry by day labor. Plastering, heating, electric, plumbing and painting to be let.

Walls are up 1 storey for 1 pair residences, $7,000, south side 8th Ave. near Woodbine Ave. Owner and builder is A. J. Baldwin, 167 Coleridge Ave., who is receiving tenders on electric, heating, painting, plastering and plumbing.

Foundations are in for 1 pair residences, $7,500, west side Cannon Ave. near Gerrard E. Owner and builder—Gaylord & Wood, 58 Eaton Ave. Masonry by day labor. Plastering, heating, electric, plumbing and painting to be let.

Foundations are going in for 2 pair residences, $7,000 a pair, north side Castlefield Ave., near Avenue Rd. Owner and builder is Maurice Rash, 218 Bellwoods Ave., who will let painting, plastering, electric, plumbing and heating trades. Masonry by day labor.

Foundations are going in for 2 residences, $3,500 each, north side Balliol St., near Forsyth Ave. Masonry day labor. Plastering, painting, electric, heating and plumbing to be let by owner and builder, Peter McMaster, Searboro Jct.

Excavating work has been done for 2 residences, $4,000 each, north side Westbrook, near Chisholm Ave. Owner and builder is I. Hopkins, 19 Westbrook Ave. Masonry day labor. Plastering, painting, electric, heating and plumbing to be let.

Work is to start shortly on 2 pair houses, $7,000 pair, west side Coxwell, near Danforth. Thos. Bros., 304 Glebemount Ave., are the owners and builders. Electric, plastering, painting, heating and plumbing trades to be let.

Foundations are going in for $8,500 residence east side Rosewell Ave., near Glengrove. Owner and builder is E. Ward & Son, 21 Richmond W., and will let painting, plastering, electric, plumbing and heating trades. Carpentry and masonry by day labor.

Jas. Carr, 4 Oakdale Crescent, is owner and builder of 4 pair residences, $7,000 a pair, on Montgomery Ave. Tenders are being received by owner on brickwork. Other trades to be let later.

Excavation work is being done for 2 pair residences, $20,000 corner west corner Lappin and St. Clarens Ave. L. Longo, 401 Osler Ave., is owner and builder. Plastering, painting, electric heating and plumbing to be let.

V. G. Laughton 154 Evelyn Crescent, is owner and builder of 2 residences $6,500 each, 1057 Evans Ave. Electric plumbing and heating to be let. Carpentry by owners own staff.

The walls are going up for 1 pair residences, $4,000 each, east side Kent Rd. near Applegrove. Fred Stevens, 2 Beck Ave., is owner and builder. Electric heating and plumbing to be let.

Footings are in for 2 residences, $6,000 each, at 140-2 Gilbert Ave. Harry Steadman, 190 Northcliffe Blvd., is owner and builder.

Foundations are going in for 2 residences, $6,500 each, at 673-5 Windermere Ave. E. B. Luney, 664 Abbette St., is owner and builder. Electric, plumbing, painting, plastering and heating trades to be let.

Tillsonburg, Ont.

Steven Scott is owner of $5,000 residence being built on Brock St. Work by day labor. No materials purchased.

CONTRACTS AWARDED

Aylmer, Que.

N. Beaupre, Aylmer, Que., has the general contract for building ten residences here, total cost $40,000.

Cooksville, Ont.

The walls are up for $6,000 residence on Melville Park. Following sub-trades have been let: plumbing—J. W. Scott, Port Credit; electric—H. V. Moore, Cooksville. Painting and heating to be let. Owner and builder is W. F. B. Rubidge, Port Credit.

Montreal, Que.

The following sub-trades have been let on $15,000 residence being built corner Queen Mary and Finchley Road, for J. T. Stranger & Co., 10 St. John St.; millwork—Wm. Rutherford & Son, roofing—Geo. W. Reed & Co.; painting and glazing by general contractor, C. Thompson, care H. S. Taylor & Co. Marble, plastering and tiling to be let.

Work is in progress for $25,000 repairs to residence at 443 University Ave., owned by Parish of Christ Church. Masonry, painting and glazing by general contractor, Purdy & Henderson Co., Ltd. Millwork and plastering trades to be let. Architects, Ross & MacDonald.

H. R. Cassidy, 255 Regent St., has the contract for electrical work and Brown & Son, 26 Victoria Sq. tiling, in connection with repairs to residence at 595 Pine Ave., costing $15,000 for A. Colville, 595 Pine Ave. General contractor is A. K. Hutchison, 10 Catheart St.

The frame-work is now going up for 12 residences, $96,000 on Harvard, between Monkland and Terrebonne. Owner and builder, Badgley Construction Co. Painting and glazing by L. Asselin, 12 Orleans St. Masonry, millwork, roofing, electric, plumbing, heating, plastering and tiling to be let.

[illegible] Ave. A. Lafleur and Harlow Ave. [illegible] Mitchell, 181 Dorais Road. [illegible] 1-3 Wellington St. [illegible] tractor. Masonry millwork roofing electric [illegible] plastering painting and glazing to be let.

E. Bellehumeur, 1[illegible] Dorchester St. has the general contract let $8,000 residence being built on Ontario, between Joliette and Chambly for Mme. L. Prescott, 947 Dorchester St. Masonry millwork roofing electric plumbing and plastering to be let.

Outremont, Que.

G. R. Lacker Co. 113 Mansfield, has the contract for tiling in connection with $27,000 cottage being built on Maplewood, corner McCulloch, for Jas. Mogum, 1158 St. Hubert St. General contractor, Collett & Freres, 244 St. Hubert St.; architects—Perrault & Gadbois.

Ottawa, Ont.

The walls are going up for $6,000 residence on Brighton Ave. Following sub-trades have been let; electric—H. L. Allen; plastering—Patterson Bros.; plumbing and heating—J. Allen, Euclid Ave.; painting by day labor. Owner and general contractor—Rostetter & Taylor, 89 Belmont Ave.

The following sub-trades have been let in connection with altering store into apartments, on Arlington Ave., to cost $11,000; electric—Wallace Chugg, Bank and Second Ave., plumbing and heating—F. Bronke, Hurdmans Bridge; plastering—P. Beaupry, Henry St.; painting by day labor. General contractor is J. B. Daust, Carleton.

The following sub-trades have been let on $60,000 residence being built on Riverdale Ave.; electric—J. A. Elliott, Bank and Strathcona Ave., plumbing and heating—Vand & Cole; plastering—T. Patterson, Rosedale Ave.; painting by day work. Owner and general contractor is E. O. Switzer, Britannia Heights, near Ottawa.

The walls are going up for 2 residences, $10,000 on Sunset Blvd. The following sub-trades have been let, electric—Stan. Lewis, 63 Metcalfe St., plumbing and heating—W. G. Edge Co., Ltd. Plastering and painting by day labor. Owner and general contractor Graves Construction Co., Ltd.

The following sub-trades have been let on $7,000 residence being built on Powell Ave. for David Arbuckle, 215 Argyle Ave., owner and general contractor, electric—J. A. Elliott, Bank and Strathcona Sts.; plastering—W. Green, care owner, plumbing and heating—I. Bronke, Hurdmans Bridge, painting by day labor.

Port Colborne, Ont.

F. C. Kelso has the contract for heating and plumbing and Peter Beam the plastering on 2 residences $8,200 each, being built on Steel St. for L. Turnbull.

St Laurent, Que

Sarnia, Ont

Toronto, Ont

The following sub-trades have been let on 4 pair residences, north side Rayme... Southern Blvd., for S... Chambers Bldg.; electric... and heating—Mechanical ... Ltd.; masonry—J. Rees, 14 Lark St.; carpentry—R. F. Tobin & Son; plastering—Robertson & Findlay; painting—D. Norris, Dawes Ave.; tiling—... Mosaic & Tile Co., Ltd. Architects—Horwood & White, 299 Yonge St.

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The walls are up one storey for 4 pair residences, $7,000, north side Gerrard E... Hollywood Crescent. A. Connell, 12... Normandy Blvd., is the owner and builder. Plumbing and heating—Jos. Lester, 682 Kingston Rd. Painting day labor. Other trades by owners own staff and buys material as required.

The following sub trades have been let on 4 pair residences, $7,500, east side Eighth Ave. for Chas. C. Rigby, 234 Milverton Blvd., owner and builder; electric—J. B. Kilner, 195 Gillard Ave.; plumbing—J. W. Barrett, 209 Milverton Blvd.; heating—York Sheet Metal Co.; painting—A. Stone, care owner.

The walls are going up for $12,000 duplex residence at 4 Northcliffe Blvd., owned by Harry J. Long, 76 Glendonwynne Ave. Following sub-trades have been let, electric—P. J. Dunn, 243 Fairview Blvd.; plumbing—H. Ruddick, 54 Appleton Ave.; heating—J. G. Jackson, 411 Kennedy Ave.; plastering—Saderley & Bushel, care builder.

L. Longon, 301 Osler Ave., has been awarded the contract for footings in connection with $126,000 apartment house being erected south west corner Homewood Ave. and Wellesley Cres. Owner is D. Lavine, 398 St. Clair West; architects, Kaplan & Sprachman, 298 Dundas W.

A. Grant, 837 Logan Ave., has been awarded the general contract for building $10,500 detached residence south side Alexander Blvd., for A. V. Orr, 18 Lake Front.

Wm. J. Webb, 49 Triller Ave., is the builder of $9,000 duplex residence at 17 Glendale Ave., for Arthur W. Morley, care builder. Plumbing, heating, electric, plastering and painting to be let.

The following sub-trades have been let on 1 pair residences, $7,500, west side Kingswood Rd., near Swanwick Ave.; electric—R. Smith, 371 Woodbine Ave.; plumbing—W. Watson, 10 Blong. Ave.; heating—York Sheet Metal Co., 38 Ferrier Ave.; plastering—J. Thomas, 131 Chisholm Ave.; painting—Mr. Hockey, care owner and builder, H. McCaffery, 25 Meagher.

W. Boxall, 1083 St. Clarens Ave., has the plumbing and heating contract for $7,500 residence east side Arlington Ave. near High St. Owners and builders—Rayfield & Shenfield, 185 Westmount Ave.

I. Maude, 19 Rowland Ave., has the heating and plumbing contract on $15,000 residence being built at 216 Howard Park Ave., for J. C. Raynor, 292a Runnymede Rd.

C. May, 498 Main St., is owner and builder of 2 residences, $4,000 each, east side Meagher, near Orley Ave. Electric, plastering and plumbing to be let. Painting by owner, day labor. Heating—Matthewson Hardware Co., 177 Queen East.

Geo. Durie, 54 Iona Ave., is owner and builder of 2 residences, $4,000 each, east side Meagher, near Westbrook Ave. Masonry day labor. Electric, plastering, painting, heating and plumbing to be let.

Foundations are in for $14,000 residence, north side Chaplin Cres., near Lesmoir Blvd. Burk & Co., 18 Toronto St., are the owners and builders. Masonry day labor. Carpentry—Robt. Gibson, 27 McPherson Ave. Other trades to be let.

Windsor, Ont.

A. McKenzie, 379 Wellington Ave., has the general contract for $5,000 residence to be built on Dougall Ave., for Wm. Beatman, 1241 Dougall Ave. Electric, plastering, painting and plumbing to be let. No material purchased.

M. Marentette, 815 Brant St., is the general contractor for $6,000 residence on Arthur St., owned by E. Cote, 813 Sandwich St. E. Electric, plastering and plumbing to be let.

Power Plants, Electricity and Telephones

Hemming's Falls, Que.

Work is in progress on railway running into site of $1,500,000 power development and dam owned by Southern Canada Power Co., Montreal. General contractors are Foundation Co., Ltd., Montreal. All trades to be let shortly.

Nictaux Falls, N. S.

Middleton town council contemplate the installation of a $20,000 power unit. By-law on this work will shortly be submitted to ratepayers, and if passed, work will probably proceed in 1924.

Wheatley, Ont.

Work is to start at once for $13,000 electric lighting system. A new hydro line is to be built from Leamington and system equipped at Wheatley. All work under direction of Ontario Hydro Power engineers.

CONTRACTS AWARDED

Fort William, Ont.

Foundation is in for $15,000 transformer for Great Lakes Paper Co., Ltd., of Fort William. General contractor and architect—Barnett & McQueen, Ltd., Fort William.

Port Hope, Ont.

Clarence Villsworth, Port Hope, has the contract for electrical work on $16,000 telephone exchange being built here. Painting and glazing by general contractor, Garnett & Sons.

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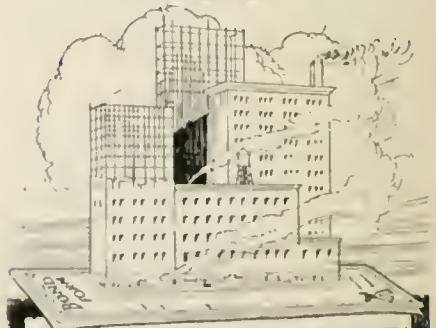

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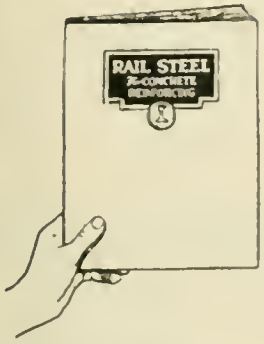

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Specify your reinforcing steel to meet ASTM Specification A-16-14 or Canadian Engineering Standards Association A-9-1923-B.

Current Prices of Building and Engineering Materials

		Toronto	Montreal	Winnipeg	Vancouver
CEMENT (Delivered on job):—					
Barrel lots, including barrel, delivered	per bbl	$1.60	$4.16	$5.00	$4.30
Car lots, including barrel, f.o.b. siding	per bbl.	3.45*	3.48	4.20	4.20
Retail on bags	each	.20	.20	.20	.20
LIME					
Lump, in retail lots, delivered	per ton	14.30	13.00	.58 bu.	2.70 bbl
Lump, in car lots f.o.b. siding	per ton	11.80	9.50	13.80 ton*	2.60 bbl
Hydrated, white, in retail lots, delivered	per ton	20.00	26.00	.63 bag†	22.00
Hydrated, white, in car lots, f.o.b. siding	per ton	18.00	21.00	.56 bag†	18.00
Hydrated, grey, in retail lots, delivered	per ton	18.75	19.00		
BRICK and TILE (Delivered on job):—					
Common face brick	per M.	24.00	16.50*	19.00	23.00
No. 1 dry pressed brick	per M.	30.00	30.00	36.00	65.00
No. 2 dry pressed brick	per M.	28.50	25.00	32.00	
Enamelled brick	per M.	125.00 up	180.00	185.00	150.00
Wire cut brick, for foundation work	per M.	21.00	19.00		40.00
Sand lime brick	per M	17.00		18.00	19.00
Hollow building tile	per M.			8-12c. per ft.	105-240.00
Paving brick imported	per M.	on appl	100.00	55.00	60.00
Fire brick	per M.	68-95	60-75	85-100	70.00
Fire clay	per ton	13-20	15-16.00	35.00	20.00
STONE, SAND and GRAVEL (f.o.b. cars on siding):—					
Crushed stone, 2 in.	per ton	2.05**	1.80	2.45 yd.*	$2.75 yd.
Crushed stone, 1 in. and under	per ton	2.31	1.90	2.75 "	" "
Crusher run	per ton	2.20½		3.00 "	" "
Rubble stone	per ton	2.45	1.70	15.00 cord	" "
Gravel, 2 in. screened	per ton	1.84		2.45 yd.	" "
Gravel 1 in. screened	per ton	2.05	1.50	2.75 "	" "
Sand, screened	per ton	1.26½	1.25	1.90 yd.	2.50 yd.
Pit run	per ton	1.52¾	1.25	1.90 "	" "
STEEL and IRON (f.o.b. warehouse):—					
Mild steel bars, ¼ in. and heavier	per 100 lbs	3.90 base†	4.00 base	4.90	4.00
Bands 3/16 in. and lighter	per 100 lbs.	4.40 "	4.50 "	5.40 base	
Hoops	per 100 lbs	5.00 "	5.00 "		
Angles, channels and tees under 3 in.	per 100 lbs.	4.50 "	4.00 "	5.45	6.00
Structural shapes	per 100 lbs.	4.25 "	4.25 "	5.35 base	6.00
Plates—¼ in. and heavier	per 100 lbs.	3.75 "	3.90 "	5.45	6.25
Plates—3/16 in.	per 100 lbs.	4.25 "	4.25 "	5.85	6.50
Plates—10 gauge	per 100 lbs.	4.60 "	4.50 "	6.15	6.50
Black sheets—28 gauge	per 100 lbs.	5.60 "	5.00 "	6.50	8.25
Galvanized sheets—28 gauge	per 100 lbs.	6.75 "	7.00 "	7.85	9.35
Galvanized Corrugated sheets—28 gauge	per 100 ft.	7.00 "	7.00 "	7.70	8.25-8.50
Rivets	per 100 lbs.	6.25 "	6.00 "	7.50 base	
Cast iron pipe	per ton	67.50	60.00 "		
VITRIFIED CLAY PRODUCTS (Delivered on job):—					
Sewer pipe, 4 in.	per ft	.40	.30	.35	.25
Sewer pipe, 6 in	per ft.	.60	.45	.40	.35
Sewer pipe, 8 in.	per ft.	.80	.70	.60	.45
Sewer pipe, 9 in.	per ft.	1.00	.85	.70	.60
Sewer pipe, 10 in.	per ft.	1.20	1.05	.80	.55
Sewer pipe, 12 in.	per ft.	1.50	1.35	1.00	.65
Sewer pipe, 15 in.	per ft.	2.25	1.80	1.85	.95
Sewer pipe, 18 in.	per ft.	3.00	2.50	2.45	1.50
Sewer pipe, 21 in.	per ft.	4.00	3.00		1.90
Sewer pipe, 24 in.	per ft	6.00	4.50	3.75	3.10
Tile wall coping, 8 or 9 in.	per ft	.60	.50		.50
Tile wall coping, 12 or 13 in.	per ft.	.90	.75		.60
Flue lining, 8½ x 8½ in.	per ft.	.70*	.60	.55	.40
Flue lining, 8½ x 13 in.	per ft	1.00*	.90	.65	.75
Chimney tops	each	9.00	14.00	7.50	4.50–6.00
Discounts		45 % truck lots 50 % car lots	20 % 50 %	5 %	

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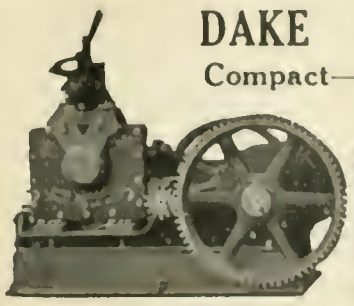
STONE, SAND AND GRAVEL —*Winnipeg prices subject to 5% discount **Toronto prices include sales tax.
STEEL —*Extras on various steel lines were advanced recently. New list may be had on application to dealers
VITRIFIED CLAY PRODUCTS — Discount on flue linings is 55%



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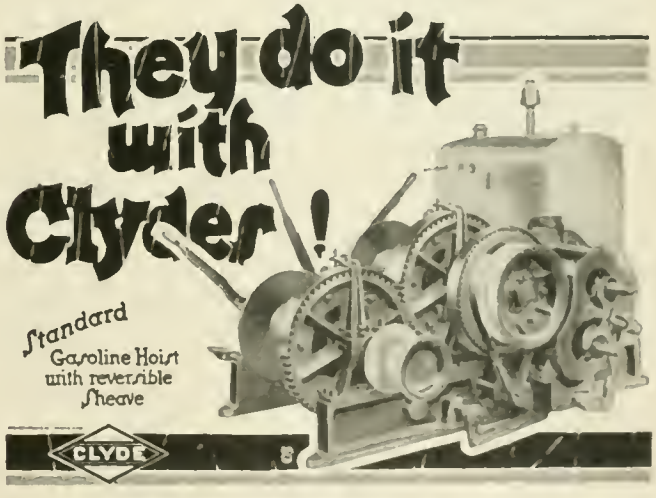

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Lumber (Delivered on job):—	Toronto	Montreal	Winnipeg	Vancouver
Flooring, 1 x 3 and 4 in., clear, E. G. fir ....per M.	100.00	60.00	80.00	63.00
Flooring, 1 x 3 and 4 in., clear, F. G fir ....per M.	75.00	65.00	56.00	43.00
Flooring, No. 1 pine ....per M.	75.00	80.00		
Flooring, No. 1 Spruce ....per M.	52.00	45.00		
Flooring, birch and maple, 13/16 in. clear ....per M.	130.00	110.00	156.00	200.00
Flooring, plain red oak, ⅜ in clear ....per M.	120.00	125.00	136.00	265.00
V joint, 1 x 3 and 4 in., Nos 1 and 2, clear, fir ...per M.	75.00	65.00	56.00	45.00
V joint, No. 1 pine ....per M.	75.00	85.00	63.00	
Pine, 1 x 4 to 12 in., common rough ....per M.	46/61	45.00	40.00	
Red and Jack Pine, 2 x 4 to 12 in., com. rough per M.	48/58	70.00	36.00	
Hemlock, 2 x 4 to 12 in ....per M.	41/45	40.00	36.00	11.50-18.75
Fir, 1 x 4 to 12 in No 1 common, D 1 S ....per M.	45/60	50.00	35.20	20.00/25.00
Spruce, 1 and 2 x 4 to 12 in. ....per M.	48/60	45-35	36.00	
Timbers, fir, 10 x 10 in. and up ....per M.	65.00	58.00	53.60 base	17.-22.00
Lath, No. 1 white pine ....per M.	13.50	12.00	11.20	
Lath, M. R. spruce ....per M.	9.50	8.50	8.40	7.00
Shingles, XXX B.C. cedar ....per M.	6.00	5.00	5.60	3.25
XX B.C. cedar ....per M.	4.50	4.25	3.20	1.90
N.B extras ....per M.	6.50	6.75		
N.B. clears ....per M.	6.00	5.50		
Pine casing ....per M.	1 ct. per in.	95.00	115.00	55.00
Fir casing ....per M.	1¼ ct. per in.	100.00	105.00	70.00
PAINTS, OILS, COLOURS (delivered):—				
White lead ground in oil, less than ton lots ....per cwt.	13.25	14.60	15.60	16.30
Red lead, dry, small lots ....per cwt.	17.00	9.55	22.00	16.00
Putty in bulk ....per cwt.	5.95	4.25	5.25	7.75
Steel sash putty in bulk ....per cwt.	6.45	6.00	8.00	7.75
Boiled linseed oil, in bbls. ....per gal.	1.20	1.40	1.30	1.46
Raw linseed oil, in bbls. ....per gal.	1.17	1.38	1.33	1.43
Turpentine, in bbls. ....per gal.	1.50	2.20	1.70	2.25
Mortar Color, maroon, in bbls. ....per lb.	.02¼		.06 9/10	6.45 per cwt.
Mortar Color, black, in bbls. ....per lb.	.08		.06 4/5	.45
PLASTER (Delivered):—				
Hard wall plaster, sanded ....per ton	13.50	15.00	26.00	26.00
Plaster of paris, in bbl. lots ....per bbl.	5.50	5.35	1.60 bag*	7.50
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LABOR:—				
Bricklayers ....per hr.	1.00	.80–.90	1.10	1.06¼
Structural Iron Workers ....per hr.	.85	.50–.75	.90	1.00
Plasterers ....per hr.	1.25	.80	1.07½	1.06¼
Hoisting Engineers ....per hr.	.70–.80	.50	.85-1.00	1.00
Plumbers ....per hr.	.90	.60–.75	1.00	.90
Carpenters ....per hr.	.90	.65	.85	.81¼
Painters ....per hr.	.75	.55–.65	.75	81¼
Electrical Workers ....per hr.	.80	.65	.65- .85	1.00
Roofers ....per hr.	.65	.65	.50	.90
Laborers (Common) ....per hr.	.40–.50	.30	.42½	.50-.56¼
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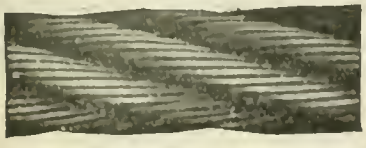

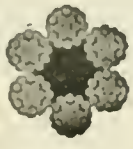

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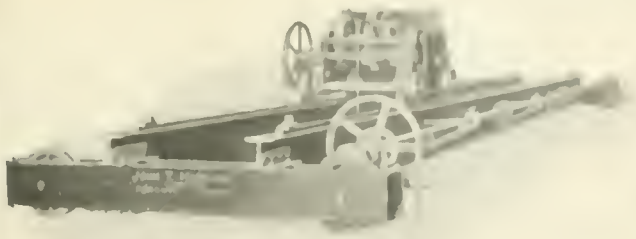

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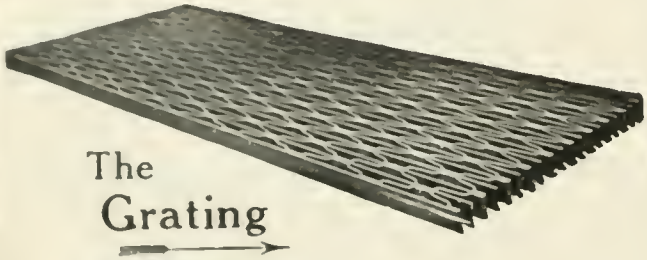

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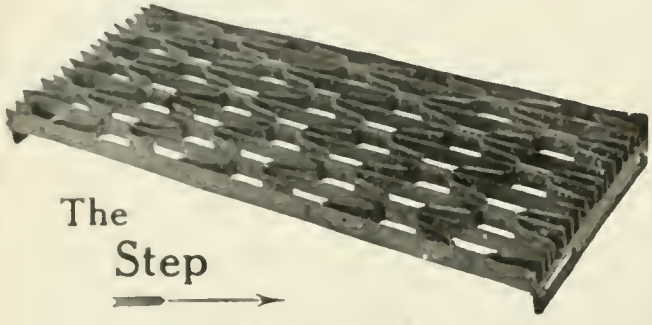

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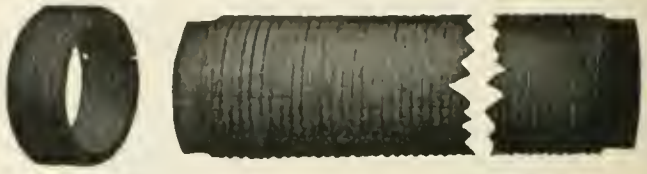

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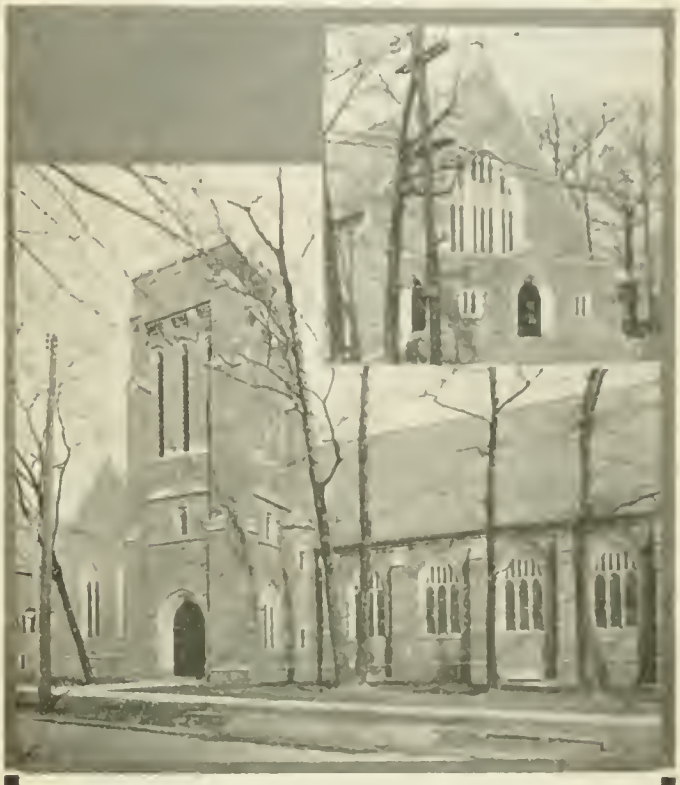

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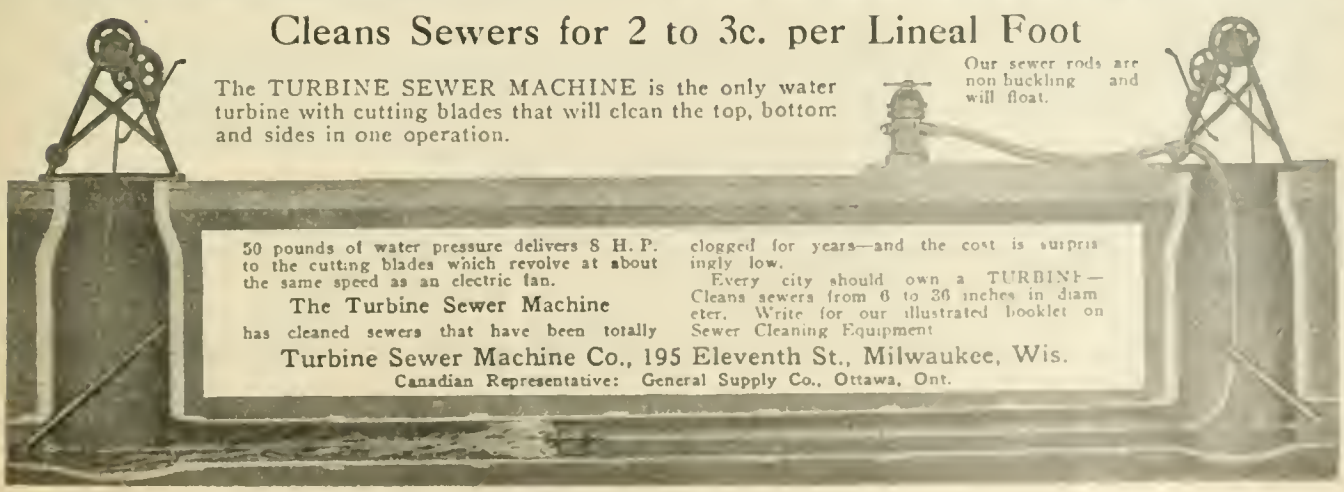

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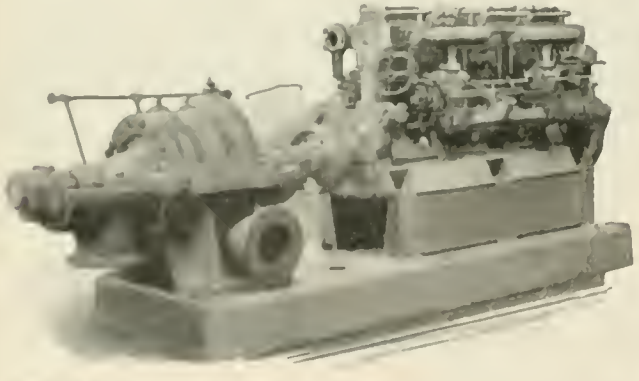

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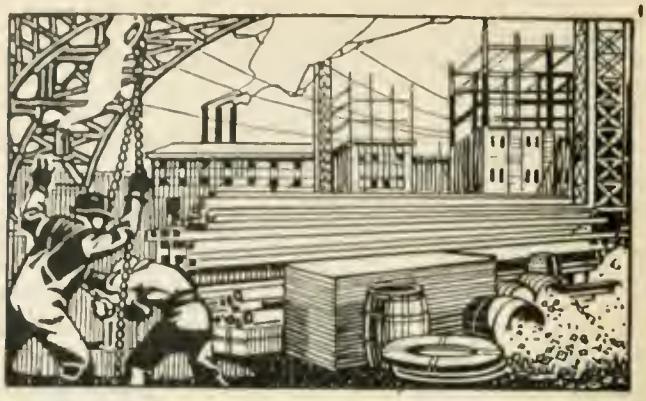

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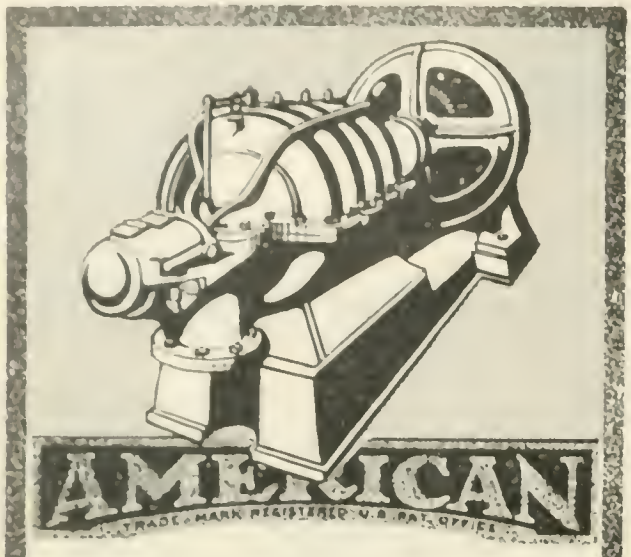

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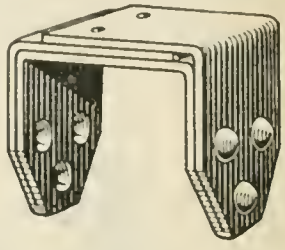

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And I gave them the Scripture text
"You keep your light so shining
A little in front o' the next."

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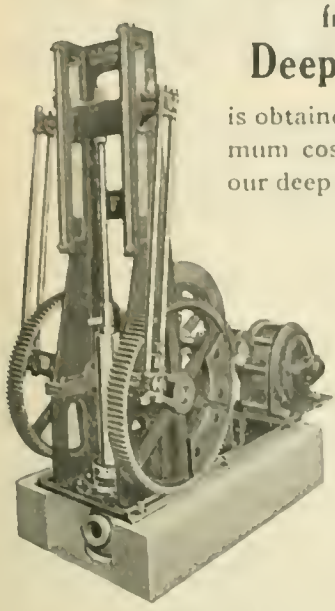

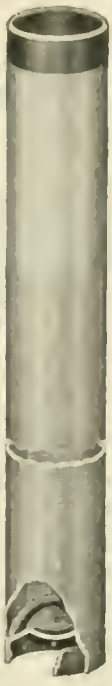

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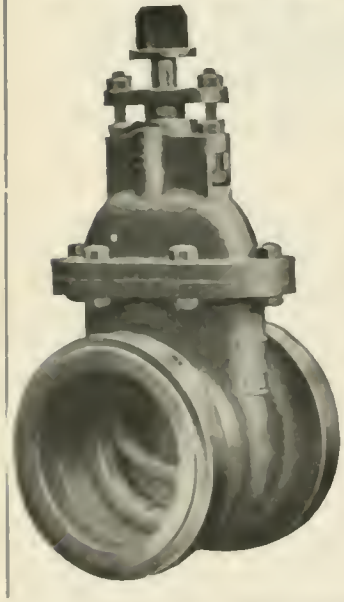

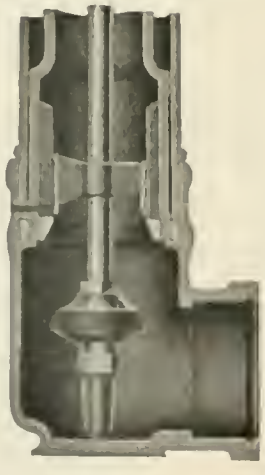

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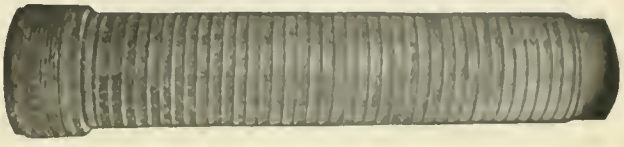

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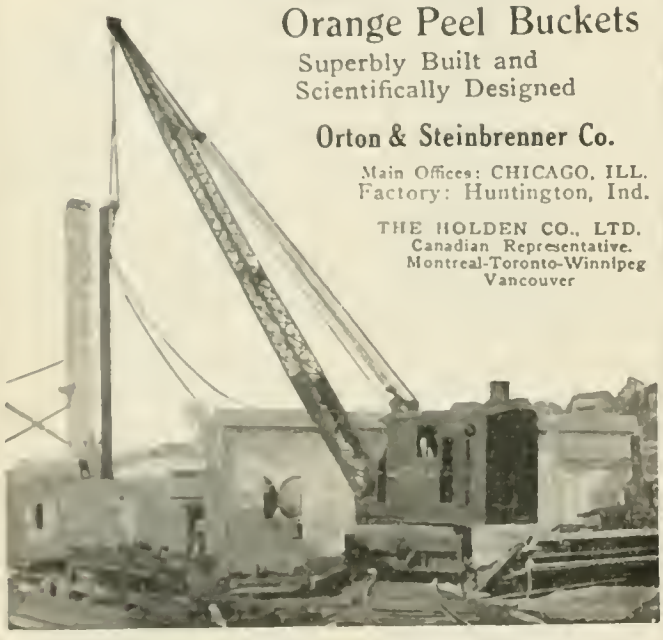

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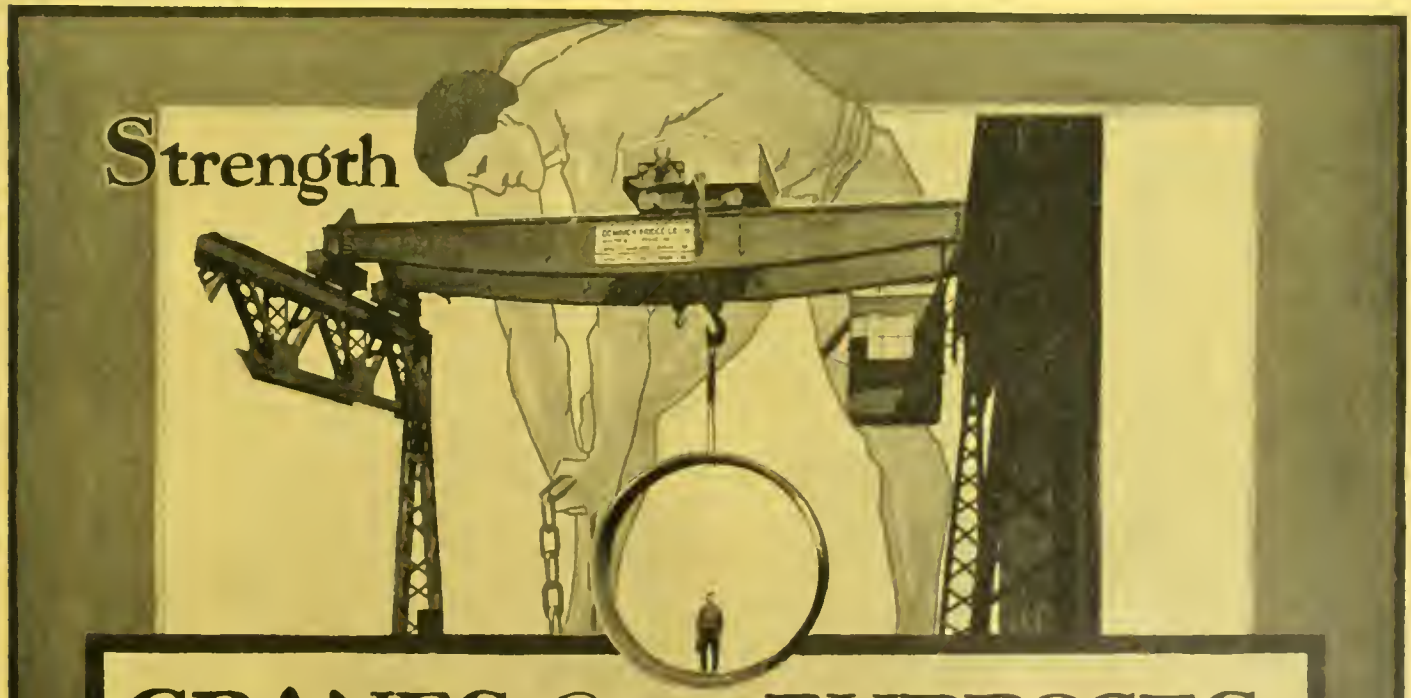

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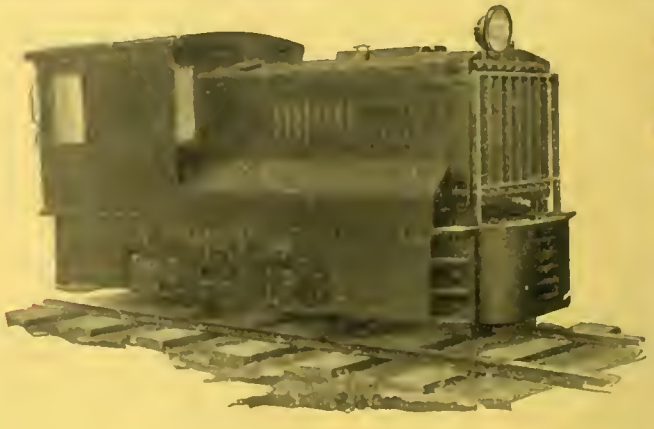

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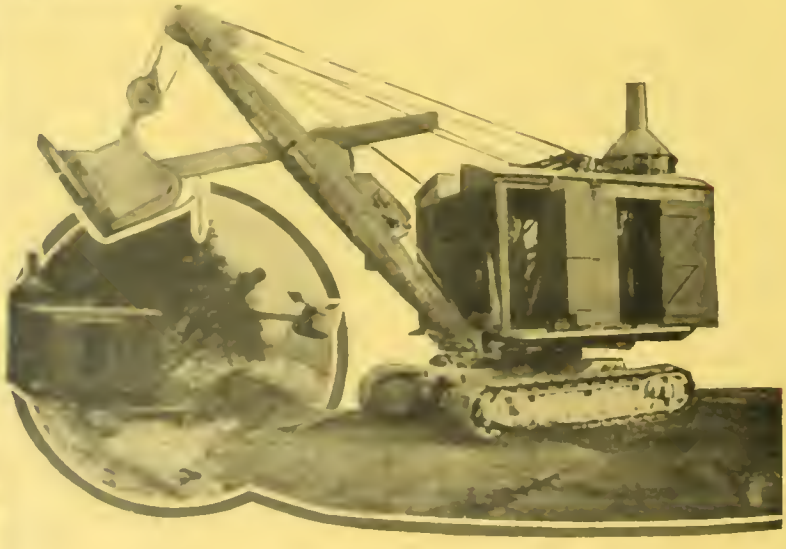

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